

California Environmental Protection Agency

 Air Resources Board

Final Statement of Reasons for Rulemaking
Including Summary of Comments and Agency Responses

**PUBLIC HEARING TO CONSIDER THE ADOPTION OF A
PROPOSED REGULATION FOR IN-USE OFF-ROAD DIESEL VEHICLES**

Public Hearing Date: May 25, 2007, Continued to July 26, 2007
Agenda Item No.: 07-5-6

TABLE OF CONTENTS¹

I	GENERAL.....	1
II	MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL AND ADDITIONAL DOCUMENTS MADE PUBLICLY AVAILABLE	3
III	SUMMARY OF COMMENTS AND AGENCY RESPONSES TO THE ORIGINAL PROPOSAL.....	6
A.	Comments Submitted Up to and at the Board Hearing.....	6
1.	Need for Emission Reductions.....	34
1)a), d), f), & i)	No Further Emission Reductions Needed.....	35
1)b)	Enough Improvement with Introduction of Tier 3 and 4 Engines	37
1)c)	Doubting Diesel PM Health Risk.....	39
1)g)	My Engine Does Not Pollute.....	48
1)j)	Diesel Risk Reduction Plan Too Old.....	49
2.	Technical Feasibility.....	51
2)a)	Retrofits	54
2)a)i)	Availability of Retrofits	54
2)a)ii)	Retrofit Safety	58
2)a)ii)1)	Safety Procedure for Retrofits	64
2)a)ii)2)	Retrofit Removal Provision	66
2)a)ii)3)	Safety Review by Safety Professional	66
2)a)iii)	Verification Procedure for VDECS	67
2)a)iii)1)	Verification Too Long or Complicated	67
2)a)iii)2)	Installation Ability Not Included in Verification	70
2)a)iii)3)	Ski Industry Equipment Not Included in Verification	72
2)a)iii)4)	Validate Effectiveness of Retrofits	73
2)a)iii)5)	VDECS Testing Inadequate.....	73
2)a)iv)	Retrofits Unproven.....	74
2)a)v)	Wait for Original Equipment Manufacturer VDECS	77
2)a)vi)	Use of active VDECS.....	78
2)a)vi)1)	Active VDECS Not Feasible for Off-road Applications	78
2)a)vi)2)	Regeneration On-site Not Feasible	79
2)a)vi)3)	Time and Expense of Regeneration	79
2)a)ix)	Responsibility for Failure Contested	80
2)a)x)	Need to Forecast Demand	82

¹ **Please note:** Some sections in the outline have been intentionally left blank and are noted as such. Also, some sections have been combined and are noted as well. For example, sections 1)a), d), f), and i) are combined into one.

2)a)xi) Limited Resources Available for Developing Solutions.....	83
2)a)xii) Insufficient Lead Time for Manufacturers	84
2)a)xiii) Poor Installations of Retrofits	85
2)a)xiv) NOx Retrofits Will be Available	87
2)a)xv) VDECS not Practical for Large or Small Vehicles.....	87
2)a)xvii) Ash Disposal	88
2)a)xviii) Retrofits May Damage Engines.....	89
2)a)xx) GSE Testing Not Included in Verification.....	89
2)b) Repowers	91
2)b)i) Availability of Repowers	91
2)b)ii) Feasibility of Repowers.....	92
2)b)iii) Down Time for Repowers	95
2)c) New Vehicles	96
2)c)i) Availability of New Vehicles	96
2)c)ii) Provisions for Tier 3 Vehicle Delay	103
2)c)iii) Failure of New Engines to Operate Properly.....	103
2)d) Technology Lacking to Address Both PM and NOx.....	104
2)e) Need More NOx Technologies	106
2)f) New Technology Possibly Not Reliable	107
2)g) Availability of Used Vehicles.....	110
2)h) Effect on Industries that Support Used Vehicles	113
3. Cost and Cost-Effectiveness.....	114
3)a) Affordability.....	114
3)a)i) Affordability for Fleets Owners	114
3)a)i1) Loss of Fleet Profits.....	127
3)a)i2) Affordability of Complying Twice	129
3)a)i3) Cannot Afford New Equipment.....	131
3)a)ii) Not Affordable for Small/Medium/Minority Businesses	132
3)a)iii) Downturn in Economy	146
3)a)iv) Shrink to Comply	149
3)a)iv1) Reduced Industry Capacity	151
3)a)iv2) Fleet Expansion Discouraged.....	152
3)a)v) Business Leaving the State	153
3)a)vi) Decreasing Fleet Numbers	154
3)b) Regulation is Costly.....	156
3)b)i) Cost for Industry	159
3)b)ii) Effects on Economy.....	163
3)b)iii) National Level Impacts.....	168

3)b)iv) Low Population County Impacts	169
3)b)v) Public Agency Costs.....	170
3)b)vi) Funds for Other Technologies	171
3)b)vii) Cost Falls on One Industry	172
3)b)viii) True Cost of Regulation	173
3)b)ix) Average Fleet Costs	174
3)b)x) Cost of Enforcement.....	174
3)b)xii) Reductions in Vendor Businesses	175
3)b)xii) Lack of Compliant Equipment	175
3)b)xiii) Front Loaded Costs.....	176
3)b)xiv) Cumulative Cost Impacts	177
3)b>xv) Destroys Used Vehicle and Rental Markets	179
3)b)xvi) Fines	180
3)c) Industry Estimate Cost Discrepancy	181
3)d)i) Compliance Costs	192
3)d)i)1) Inaccurate Mining Costs.....	197
3)d)i)2) Inaccurate Waste Removal Costs	198
3)d)ii) Cost Discrepancy.....	199
3)d)iii) Third Party Cost Evaluation	202
3)d)iv) Inaccurate Understanding of Affected Industries	203
3)d)v) Cost-effectiveness	206
3)d)vi) Cost Range.....	208
3)d)vii) Underestimated Vehicle Costs.....	210
3)d)vii)1) Vehicle Replacement.....	212
3)d)vii)2) Market Effects.....	213
3)d)viii) Underestimated Repower Costs	214
3)d)viii)1) Tier 3 Repower Solutions.....	216
3)d)viii)2) Large Fleet Repower Costs	216
3)d)ix) VDECS costs	217
3)d)ix)1) Expensive VDECS.....	217
3)d)ix)2) Waste of Money.....	219
3)d)ix)3) Underestimated VDECS Costs.....	219
3)d)ix)4) VDECS Installation and Maintenance Costs	221
3)d)ix)5) Replacement VDECS	222
3)d)ix)6) GSE VDECS Costs	222
3)d)x) Record Keeping Costs.....	223
3)d)xi) Increased Home Costs	223
3)e) Financial Affects	224

3)e)ii) Devalued Equipment	224
3)e)ii) Fleet Debt	227
3)e)iii) Fleet Net Worth/Equity	229
3)e)iv) Fleet Credit	231
3)e)iv)1) VDECS Loans	234
3)e)v) Bonding Capacity	234
3)e)vi) Passing on Costs	238
3)f) Increased Costs	244
3)f)i) Increased Equipment Costs	244
3)f)ii) Increased Costs in California	246
3)f)iii) Increased Infrastructure Costs	248
3)f)iii)1) Shrinking Fleet Project Delays	252
3)f)iii)2) Slowed Infrastructure Projects	253
3)f)iv) Infrastructure Bond Money	254
3)f)v) Rental Rate Increases	259
3)f)vi) Fuel Efficiency Decreases	260
3)f)vii) Waste Collection Increases	261
3)f)viii) Decreased Competition	261
3)g) Job Losses	263
3)g)i) Downsizing Fleets	265
3)g)ii) Increased Bidding Costs	268
3)g)iii) Underestimated Job Losses	268
3)g)iv) Other Market Job Losses	271
3)g)v) VDECS Jobs	271
3)g)vi) Job Loss Effects on Economy	272
3)g)vii) Job Loss Indirect Effects	272
3)g)viii) Tier 0 Job Losses	272
3)g)ix) Decreased Wages and Benefits	273
3)h) Return on equity (ROE) Analysis	273
3)i) Periodically Update Economic Analysis	273
3)j) Staff Report Economic Impacts	274
3)k) Low-Use Vehicles	274
4. Inventory and Survey	276
4)a) Inventory Inaccurate	276
4)a)i) Granite Fleet	280
4)b) Survey Inadequate	281
4)c) Underestimates Population of Vehicles	283
4)d) Base Year 2000 Inventory Data Not Presented	284

4)e) Natural Turnover Overestimated	285
4)f) Comprehensive Survey Needed.....	288
5. Complexity	289
5)a) Regulation Too Complex	289
5)a)i) Uncertain and Changing Requirements.....	290
5)a)ii) Allow Companies to Make Own Decision	292
5)b) Regulation Not Clear	292
6. Regulatory Provisions	293
6)a) Applicability	293
6)a)i) Unfair to Impose Requirements on End Users	294
6)a)i)1) Make Exceptions for the Oldest Machines That are Near the End of Their Working Lives	298
6)a)i)2) Geographic Provisions.....	298
6)a)i)3) Do Not Have Region-Specific Requirements.....	299
6)a)i)4) Have Tighter Requirements for Some Regions	300
6)a)i)5) Add Geographic Zones	301
6)a)i)6) Regulatory Authority for Leased Equipment Inadequately Addressed	302
6)a)i)7) Exempt Everything Below 50 Hp	303
6)a)i)8) Exempt Non-profits and Training Facilities	303
6)a)i)9) Exempt Certain Activities	304
6)a)i)10) Allow Retrofit Vehicles to Operate Indefinitely.....	305
6)a)i)11) Exempt Rail Equipment.....	305
6)a)i)12) Extend Low-Population County Exemption	307
6)a)i)13) Exempt Agricultural Vehicles.....	308
6)a)i)14) Exempt Low-use Vehicles	308
6)a)i)15) Exempt Private Use.....	309
6)a)i)16) Extend Exemption for Vehicles Awaiting Sale	310
6)a)i)17) Exempt Small Fleets	310
6)a)i)18) Exclude New Tier 3 Machines from Fleet's Overall Hp	311
6)a)i)19) Exempt San Clemente and San Nicolas Islands	311
6)a)vi) Regulation Unfair to Certain Types of Businesses.....	312
6)a)vi)1) Firms that have been in Business a Long Time.....	313
6)a)vi)2) Quarrying.....	314
6)a)vi)3) Impact of Regulation on GSE Different	319
6)a)ix) Change Exemption from Vehicle to Engine	321
6)a)x) Treat Waste Removal Services Differently	322
6)b)i) Raise Low-use Threshold.....	323
6)b)i)1) Base Low-use on Total Fleet Use	324

6)b)ii) More Flexibility for Big Companies with Low-Use Vehicles	325
6)b)iii) Revise Definition of Max Hp for Electric Vehicles	326
6)b)iv)1) Raise Small Fleet Threshold.....	327
6)b)iv)1a, 3a) Small Fleets Included in Captive Attainment Area Definition	328
6)b)iv)2) Remove Small Business from Small Fleet Definition.....	329
6)b)iv)3b, 3c) Additional Counties in Captive Attainment Area Exemption	329
6)b)iv)3d) Definition of Captive Attainment Area.....	332
6)b)iv)4, 5, 7, 14) Medium/Large Fleet Thresholds	333
6)b)iv)8) Feasibility Should Be Defined.....	338
6)b)iv)9) Revise Emergency Vehicle Definition.....	338
6)b)iv)10) Hp Rating to Use	339
6)b)iv)11) Define "Same Hp"	339
6)b)iv)13) Classify DoD fleets as Medium Fleets	340
6)b)v) Define "Years Old".....	341
6)b)vi) Nonprofit Training Centers.....	342
6)b)vii) Snow Removal Hours	342
6)b)viii) Need for Regulation in Rural Areas.....	344
6)b)ix) Define Method of Rounding	345
6)b)x) Define Emergency Operations	346
6)c) Stringency.....	347
6)c)i) Timing (1-10)	347
6)c)i)5) Pace of Regulation too Fast	358
6)c)ii)1) Set Fixed Targets Rather than Targets Varying Depending on Hp Distribution.....	365
6)c)ii)2) Make Fleet Average Targets Less Stringent.....	371
6)c)ii)3) Set New Targets Based on a New Inventory and Longer Schedule	373
6)c)ii)4) Effect of Targets On Timing of Owners Purchase Decisions	373
6)c)ii)5) Use Individual Fleet Average Baselines from 2000	374
6)c)ii)6) Base Targets on Horsepower-hour.....	374
6)c)ii)7) Use Three-year Fleet Averages.....	375
6)c)iii) Not Fair to Have Stricter Requirements for Large Fleets	377
6)c)iv) Do Not Strengthen Regulation	378
6)c)vi)1-4) Stricter NOx Limits for Largest Fleets.....	379
6)c)vi)5) Sunset the Low-use Exemption	382
6)c)vi)6) Add Protections for Sensitive Receptors	383
6)c)vi)7) Set Final Compliance Earlier than 2020 and 2025.....	384

6)c)vi)8) Set Stricter NOx limits for SCAQMD	385
6)c)vi)9) Include Snow Removal Vehicles.....	386
6)c)vi)10) Remove BACT Requirements.....	386
6)c)vii) Remove NOx Requirements	387
6)c)viii) Develop Off-Road Smog Check Program	388
6)c)ix) Exclude Units Exempt from the PM BACT Requirements when Calculating the Percentage Retrofit Rate	389
6)c)x) Retrofitting Prior to BACT Exemptions.....	389
6)c)xi) Unfair that NOx Requirements Added.....	390
6)c)xii) Adding Vehicle Requirements Too Strict.....	391
6)d) Credit Provisions	395
6)d)i) Early Credit Provisions	395
6)d)i)1) Count Early Repowers/Turnover Towards PM	397
6)d)i)3) Give More Early Credit for Electric GSE.....	399
6)d)i)4) Credit for Commitments	400
6)d)iii) Give More Credit for Alternative Fuels	401
6)d)iii)1) Give Credit for Natural Gas Conversions.....	402
6)d)iv) Give More or Less Credit for Electric Vehicles	402
6)d)v) Give Credit for Tier 1 Repowers	405
6)d)vi) Give Credit for Gasoline Powered Replacement Vehicles.....	406
6)d)viii) Give Credit for Level 1 VDECS	406
6)d)ix) More Incentive for Scrapping or Upgrading Vehicles.....	407
6)d)x) Do Not Require Fleets to Retire Tier 0 Vehicles First.....	407
6)d)xi) Count Retirement for PM and NOx BACT Requirements	409
6)d)xiii) Credit New Vehicles in Hours in Fleet Average Option	410
6)e) Funding	410
6)e)i) Fund Regulation More Fully with Incentive Monies	410
6)e)i)1) Fund the SOON Program.....	419
6)e)ii) Tax Credits	420
6)e)iii) Provide Incentives for Manufacturers.....	421
6)e)iv) Regulation Cuts Fleets Off from Funding.....	422
6)e)vi) How to Identify Surplus Engines for Moyer.....	423
6)e)vii) Make Funding Available for Costs over \$9/hp per Year.....	425
6)e)viii) Carl Moyer Program Too Restrictive	426
6)e)ix) No Moyer Available.....	426
6)e)x) Create a Low-Interest Loan Program for Affected Fleets	427
6)f)i) Final Requirement to Retrofit in 2021	428
6)f)ii) PM Credit for Tier 4 Replacements.....	430

6)f)iii) Unfair to Fleets that Retrofit Early if Delays Occur.....	431
6)f)iv) Give a One Year Grace Period for New VDECS	432
6)f)v) Grant an Extension for VDECS Learning Period	432
6)g) Reporting / Recordkeeping.....	433
6)h) Idling.....	436
6)i) Enforcement	437
6)k) Other Issues with Regulation.....	437
6)k)i) Do Not Make Regulation Open-Ended	437
6)k)ii) Use Real Emission Factors.....	438
6)k)iii) Take Equipment Lifespan into Account.....	439
6)k)iv) Bifurcation of the Regulation.....	440
6)k)iv)1) Bifurcation of the Regulation is Good	440
6)k)v) Double Control Required	440
6)k)vii) Alternative Provisions Suggested.....	444
6)k)vii)1) Allow Sale of Level 1 and 2 Devices to Rural Public Agencies	445
6)k)vii)2) Do Not Require 1.18 Factor in Hours in Fleet Average Option	446
6)k)vii)3) Allow Alternative Compliance Plan	449
6)k)vii)4) Allow BACT or Fleet Average	449
6)k)vii)8) Have Different Requirements for Fleets with High Horsepower	450
6)k)vii)9) Economic Hardship Exemptions	451
6)k)vii)10) Require Retrofit of Tier 0 until Tier 4 Available.....	453
6)k)vii)12) Implement a Yearly Cost Cap	453
6)k)vii)13) Regulate OEMs to Ensure Viable Equipment is Available	455
6)k)ix) Regulation Not Flexible Enough.....	456
6)k)xi) Clarify Language.....	457
6)k)xi)1) Clarify that BACT is Compliance.....	458
6)k)xii) Compliance Extension for Equipment Failure	458
6)k)xiv) ARB/City Liaison	459
6)k)xvi) Transfer of Fleet Ownership.....	459
6)k)xvii) Do Not Require Tier 4 Engines to Have a non-OEM VDECS.....	460
6)k)xix) Expand Extension for Availability of Tier 4 Engines	460
6)k)xx) Fleet Average Calculation.....	461
6)k)xxi) Modify the Time Afforded to Address VDECS Failures	462
6)k)xxii) Revise the Compliance Extension Provisions	463
7. Greenhouse Gas Impacts	464
7)a) Should Assess Greenhouse Gas Impacts	464
7)b) Address Global Warming First.....	465

8.	Consideration of Alternatives	466
8)a)	Thoroughness of Consideration of Alternatives	466
8)b)	Appoint Advisory Group to Craft Different Approach	468
8)c)	Regulate Manufacturers and Assess Fees on Old Vehicles	469
8)d)	Adopt a Different Alternative.....	470
8)d)i)	CIAQC/CBCC proposal	470
8)d)ii)	ATA Proposal.....	478
8)d)iii)	South Coast District Alternative	484
8)d)iv)	Simpler Alternative.....	485
8)e)	Biodiesel Alternatives	488
8)f)	Other Program Suggested.....	491
8)g)	Structure Regulation as a BACT Rule	493
8)h)	Check Tailpipe Emissions Instead.....	494
9.	SOON	495
9)a)	Adopt the SOON Program.....	495
9)b)	Not Enough Time to Comment on SOON Program.....	498
9)c)	Taxpayers Should Purchase the Emissions Reductions.....	498
9)d)	Funding of SOON by ARB.....	499
9)e)	Adopt 3-Year Fleet Averages in Conjunction with SOON.....	499
10.	Compliance Model	502
10)a)	Based on Too Few Fleets.....	505
10)b)	Disproportionate Number of Public Fleet.....	507
10)c)	Repowering's Effect on Useful Life Not Addressed	508
10)d)	Extrapolation from 22 Fleets.....	510
10)e)	New Purchasing Practices for Fleets.....	511
10)g)	Count of Fleet Class Sizes Inaccurate.....	512
10)h)	Model Not Appropriate for Mining	513
11.	Enforcement	513
11)a)	Regulation Difficult or Impossible To Enforce	513
11)b)	Issue a Certificate of Compliance	518
11)c)	Give Fines and Penalties Back To Fleets for Noncompliant Equipment	519
11)d)	Create a Cost-Effective Process for Enforcement	519
11)e)	Regulation Too Dependent on Self Reporting/Certification	520
11)g)	Fines for Non-compliance Not Described	521
11)h)	Third Party Certification Requirement.....	522
11)i)	Strong Enforcement.....	522
11)j)	Do Not Require Airports to Enforce the Regulation	524

11)k) Idling Enforcement.....	525
11)l) 30 Days to Apply for EIN	525
11)m) Prohibit Dumping Dirty Units in Rural Areas.....	526
12. Emission Benefits Incorrectly Estimated	526
12)a) Emission Benefits	526
12)b) Incorrect Emissions / Fleet Average Calculations.....	529
12)c) Less Benefits Due to Shortage of Compliant Vehicles.....	529
12)d) Move Dirty Equipment Out of State	530
12)e) Regulation Will Not Meet Emissions Goal	531
12)f) Focus on Both PM and NOX	533
12)h) Acrolein	534
12)h)i) Add Provision for Acrolein	534
12)h)ii) Acrolein Health Risk	535
13. Comments in Support of the Regulation	536
14. Comments Not Pertinent to the Regulation.....	538
15. Fleet Average Calculator	538
15)a) Include Hours of Operation.....	538
15)b) Has Errors	539
15)c) Not Adequate for Large Fleets in Compliance Planning	540
15)d) Calculator Not Available in Time.....	541
15)e) Continually Update the Calculator	542
15)f) Calculator Not for Compliance Purposes.....	542
15)g) Accessibility of the Calculator.....	543
16. Regulatory Procedure/Process	543
16)a) All Documents Pertinent to Rulemaking Not Made Public	543
16)c) Not Enough Stakeholder Involvement	544
16)d) Statewide Fleet Status Review	545
16)e) Form an ORD Advisory Group	546
16)f) Amendments to Regulation in Future	547
16)g) Regulations Not Modified Due to Stakeholder Input	548
16)h) Inadequate Outreach.....	549
16)j) Horsepower Cutoff.....	551
16)l) Makeup of Board	551
16)m) Develop Specific Guidelines for Local Government.....	552
16)n) Pace of Rulemaking	552
16)o) Data Ignored.....	553
16)p) Do Big Outreach Effort after Adoption	554
16)q) Change Timing of Reports to Board	555

16)r) Help with Compliance Plan	556
17. General Opposition	556
18. Do Something Else Instead of Regulation	561
18)a) Address the Gross Polluters on the US/Mexico Border First	561
18)b) Start a Pilot Program First	562
18)c,e,g,h) Regulate Someone Else First	564
18)f) Raise Exhaust Pipes	567
18)i) – Regulate Someone Else (Barrios, But Not Landfill/Recycle Centers))	568
19. Authority and Legal Issues.....	569
19)a) Violates the Health and Safety Code (H&SC)	569
19)b) California Administrative Procedure Act (APA).....	570
19)c) Preemption under Clean Air Act and U.S. EPA Authorization	577
19)d) Preemption under Federal Aviation Acts	590
19)e) Geographical Restrictions	597
19)f) Eminent Domain and Legal Challenges	600
20. Other Issues	602
20)a) Re-open and Change the Regulation	602
20)b) ARB Not Able to Implement the Regulation.....	602
20)c) Prohibit Dumping Old Equipment in Rural Counties	603
20)e) ARB Staff Should Help Fleets With Compliance	604
20)f) Regulation Will Cause People to Buy New, Rather Than Used Vehicles.....	604
B. Summary of Comments and Agency Responses – First Notice of Modified Text.....	605
1. Chapter 1	611
1)a) Applicability: Should Allow Sub-fleets to Comply Only with PM Provisions, Change Captive Attainment Area Definition.....	611
1)b) Define Rounding Procedure	612
1)c) Exempt PM Attainment Areas from PM Requirements	613
1)d) Applicability: Clarify Who is Responsible for Contractor Units	613
1)e) Define the Term “years old”	613
1)f) Clarify if Low-use Vehicles are Included in Fleet Size	614
1)g) Clarify Definition of a “new fleet”	614
1)h) Give PM Credit for Retirement of Tier 0 Vehicles	614
1)i) Credit for Alternative Fuel Conversions	615
1)j) Allow Reuse of VDECS if Vehicle is Retired or Sold Outside of State	615
1)k) VDECS That Violate Mine Safety Rules	616

1)l) Do Not Add Reporting in 2012 for Medium Fleets and 2014 for Small Fleets.....	616
1)m) Do Not Add Reporting in 2021 for Large and Medium Fleets and 2026 for Small Fleets.....	617
1)n) Requiring Medium and Small Fleets to Report Fleet Changes Between 2010 and the First Annual Reporting Date	617
1)o) Report if a Fleet is a Captive Fleet in an Attainment County	617
1)p) Define First and Final Compliance Dates	617
1)q) The 1.18 Factor Applied in Calculating Fleet Average Emissions Under the Activity-weighted Compliance Option Should Not be Adopted.....	618
1)r) Bifurcation of Regulation into NOx and PM Portions	619
1)s) Multi-year Targets.....	620
1)t) Economic Hardship Provisions.....	623
1)u) Compliance Extension for Equipment Manufacturer Delays Should Include More Detail.....	624
1)v) Appeals: Owner Should be Able to Proceed As if Appeal Has Been Granted	624
1)w) Clarify if fleet re-computes PM average after turnover.....	624
1)x) Allow more time to request a hearing	625
1)y) Compliance extension for manufacture delays should be extended.....	625
1)z) EO approval should be presumed granted	626
1)aa) Add clarification regarding what to do if engine data is unknown	626
2. Chapter 2	627
2)a) Safety procedure	627
2)b) ARB overestimated the availability of used vehicles.....	629
3. Chapter 3	632
3)a) Regulation is not concisely worded	632
4. Chapter 4	636
4)a) Greenhouse gas impacts.....	636
5. Chapter 5	643
5)a) Weekend effect.....	643
6. Chapter 6	645
6)a) SOON should be fully funded	645
6)b) SOON should be removed from the ARB Regulation	646
7. Chapter 7	647
7)a) Want another public hearing.....	647
7)b) ARB should do a big outreach effort after the adoption of the regulation.....	648

8. Chapter 8	648
8)a) California Administrative Procedure Act (APA).....	648
8)b) Violates California Environmental Quality Act (CEQA)	651
8)c) Geographical Restrictions.....	656
C. Summary of Comments and Agency Responses – Second Notice of Modified Text.....	677
1. 2nd 15-day SOON Comments	678
1)a) SOON Program Unfair to Small Businesses	678
1)b) SOON Adds Cost	679
1)c) Limit SOON to South Coast and San Joaquin	682
1)d) Change Fleet Size Provisions in SOON	684
1)e) SOON Reductions Not Counted in Statewide Regulation	684
1)f) Make SOON Voluntary	685
1)g) Do Not Limit SOON to Tier 3 Repowers	686
1)h) SOON Limits Use of Vehicles Outside the Air District	686
1)i) Loss in Equity for SOON Funded Vehicles	688
1)j) Make SOON Mandatory	690
1)k) SOON Presented as Voluntary.....	691
1)l) SOON Program Timing.....	691
1)m) SOON Effect on Competitiveness	693
1)n) Only Consider Equipment that Can be Repowered.....	693
1)o) Illegally Forces Signing of a Contract	694
1)p) Impact of SOON Misrepresented.....	696
1)q) Base SOON Participation on Reporting Data from Statewide Regulation	697
1)r) SOON Not Fully Funded	698
1)s) Partial Credit for SOON Projects Under Statewide Regulation.....	699
1)t) Hold SOON Workshops.....	699
1)u) Vehicles Moved to Different District.....	700
1)v) SOON Only for Vehicles That Will be Funded.....	700
1)w) Cost of Application for Fleets Not Receiving Funds	702
1)x) Require SOON Only for Fleets on BACT Path	703
1)y) Clarify SOON Language	704
1)z) Applicability of SOON to Rental Companies.....	704
1)aa) Cost Effectiveness of SOON	706
1)bb) Change Cost-Effectiveness Thresholds	706
1)cc) Unlikely to be Successful if Businesses Participate Unwillingly	707
1)dd) EPA Waiver	708
1)ee) Will Shift Dirty Vehicles to Other Districts	708

1)ff) Additional Public Hearing for ARB Approval of District SOON Guidelines	709
1)gg) Local Authority Granted by SOON.....	710
1)hh) Mandate Compatible District Guidelines.....	711
1)ii) SOON New Regulation Under APA	711
1)jj) Omit SOON Vehicles from Fleet Average Calculations	713
1)kk) SOON Removes Exemptions from Off-road Regulation	714
1)ll) Socioeconomic Study on SOON	715
1)mm) SOON and VDECS.....	716
1)nn) Redo the SOON Program and the Off-road Regulation.....	717
1)oo) SOON and GSE	718
1)pp) Insufficient Time for Public Comment on SOON.....	719
1)qq) Consistency with Carl Moyer Guidelines	720
1)rr) Preference for Repowering over Replacement	723
1)ss) Accounting for the SOON Program.....	724
1)tt) Reconsider CIAQC Suggestions for SOON.....	724
1)uu) SOON Too Rushed	725
2. Other 2nd 15-day Comments.....	726
2)a) Compliance Extensions for VDECS.....	726
2)b) VDECS Safety Exemption	728
2)c) Lack of VDECS.....	728
2)d) Severability Clause.....	729
D. Summary of Comments and Agency Responses – Third Notice of Modified Text.....	730
1. Comment 432 (CIAQC11).....	731
2. Comment 433 (AGCA8)	734

State of California
AIR RESOURCES BOARD

Final Statement of Reasons for Rulemaking
Including Summary of Comments and Agency Responses

PUBLIC HEARING TO CONSIDER THE ADOPTION OF A PROPOSED
REGULATION FOR IN-USE OFF-ROAD DIESEL VEHICLES

Public Hearing Date: May 24, 2007, Continued to July 26, 2007
Agenda Item No.: 07-5-6

I GENERAL

In this rulemaking, the Air Resources Board (ARB, Board) has adopted a new regulation to reduce emission of diesel particulate matter (PM) and oxides of nitrogen (NOx) from in-use off-road diesel vehicles that operate in California. The regulation is codified at title 13, California Code of Regulations (CCR). The regulation will significantly reduce the public's exposure to diesel PM and NOx emissions from the nearly 180,000 off-road diesel vehicles that operate in California by requiring fleet owners to accelerate turnover to cleaner engines and install exhaust retrofits. The regulation supports the Diesel Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, which was adopted by the Board on September 30, 2000 and the 2007 State Implementation Plan.

On April 5, 2007, ARB issued a notice for a public hearing to consider the proposed regulation at the Board's May 24-25, 2007 hearing. A "Staff Report: Initial State of Reasons" (Staff Report) and Technical Support Document (TSD) were also made available for public review and comment starting April 5, 2007. The Staff Report and TSD, which are incorporated by reference herein, described the rationale for the proposal. The text of the proposed regulation, which would add new sections 2449, 2449.1, 2449.2, and 2449.3 in title 13, CCR, was included as Appendix A, to the Staff Report. These documents were also posted on the ARB's internet site for the rulemaking at:
<http://www.arb.ca.gov/regact/2007/ordiesl07/ordiesl07.htm> ("ARB's internet site").

On May 25, 2007 the Board conducted a public hearing to consider the staff's proposal for adoption. Written and oral comments were received at the hearing, and many parties suggested changes to the proposed regulation. The Board subsequently continued the hearing until July 26, 2007 and allowed the record to remain open to accept additional public comment. At the July 26, 2007, hearing, the Board adopted Resolution 07-19, approving the proposed regulation for adoption with modifications. In accordance with section 11346.8 of the Government Code, the Board directed the Executive Officer to incorporate the modifications into the proposed regulatory text and to make such modifications

available for a supplemental comment period of at least 15 days. The Executive Officer was then directed either to adopt the regulation with such additional modifications as may be appropriate in light of the comment received, or to present the regulation to the Board for further consideration if warranted in light of the comments.

This Final Statement of Reasons (FSOR) updates the Staff Report by identifying and explaining the modifications that were made to the original proposal as a result of public comment and staff analysis after the Staff Report was issued. The FSOR also summarizes written and oral comments the Board received on the proposed regulatory text during the formal rulemaking process and the ARB's responses to those comments.

Documents Incorporated by Reference. There are no documents incorporated by reference in title 13, CCR, section 2449, 2449.1, 2449.2, or 2449.3.

Fiscal Impacts.

Fiscal Impact on State Government

The Executive Officer has determined that the proposed regulatory action will create costs, as defined in Government Code sections 11346.5(a)(6) for a state agency or in federal funding to the state, as discussed further below. Two separate fiscal effects may pertain at the state government level: costs to state agencies that own affected diesel vehicles for compliance and costs for ARB to implement and enforce the regulations. The proposed regulatory action will not affect federal funding to the state.

The total cost to state agencies for compliance is expected to be between \$84 million and \$90 million (2006 dollars). Annual costs are expected to be about \$7 million per year (until 2030). Initial costs to state agencies will occur in fiscal year (FY) 2008-2009 for the initial reporting, with the initial costs for compliance actions such as installing retrofits or repowering engines occurring in FY2009-2010. The California Department of Transportation (CalTrans) is the State agency with the largest fleet and the State agency expected to incur the greatest cost impact. Compliance costs for CalTrans, based on 2006 dollars, are expected to be \$1.2 million on average annually from FY2009-2010 until FY2029-2030 and to total \$11 million to \$13 million over the course of the regulation. It is anticipated that affected agencies will be able to plan ahead for and budget adequately to cover the costs of compliance with the regulation.

The regulation will also impose additional staffing costs to ARB. ARB staff has identified a need for additional resources to aid in implementation, outreach, education, and enforcement of the regulation.

Fiscal Impact on Local Government

The Executive Officer has determined that the proposed regulatory action will result in nondiscretionary costs for local agencies or school districts (if they own affected vehicles), and may impose a mandate, as defined in Government Code section 11346.5(a)(5). However, the mandate is not reimbursable by the state pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, because the costs would apply to all owners of affected vehicles, not just local agencies.

The regulation will impose costs on local agencies that own affected vehicles. The total cost to local agencies for compliance, based on 2006 dollars, is expected to be between \$95 million and \$106 million. Total annual costs for all affected agencies are expected to be about \$8 million per year.

Because they are exempt from having to meet the NOx performance requirements, local government fleets that are in low-population counties should expect lower annual costs of approximately \$3.60/hp to \$4.20/hp per year. For the same reason, local government agencies captive to attainment areas similarly should expect lower annual costs of \$4/hp to \$5/hp per year.

Total compliance costs for a typical local agency with 1000 hp would be \$83,000 (2006 dollars), or \$6,000 per year on average from FY2014-2015 through FY2029-2030.

The initial cost to local agencies would be in FY2008-2009 for reporting, with the first costs for compliance actions such as installing retrofits or repowering engines in FY2009-2010 for the largest local agency fleets, in FY2012-2013 for medium local agency fleets, and FY2014-2015 for small local agency fleets and those in low-population counties.

Consideration of Alternatives. The adopted regulation was the subject of discussions involving staff and the affected owners, operators, and sellers of in-use off-road diesel vehicles in California. A discussion of alternatives to the initial regulatory proposal is found in Chapter XI of the Staff Report and Chapter X of the Technical Support Document. For the reasons set forth in the Staff Report, staff's comments and responses at the hearings, and this FSOR, the Board has determined that none of the alternatives considered by the agency would be more effective in carrying out the purpose for which the regulatory action was proposed or would be as effective and less burdensome to affected private persons than the action taken by the Board.

II MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL AND ADDITIONAL DOCUMENTS MADE PUBLICLY AVAILABLE

The text of the modifications to the originally proposed regulation and the incorporated documents were made available for three supplemental 15-day comment periods by issuance of three “Notice of Public Availability of Modified Text and Availability of Additional Documents” (“15-day Notice”):

- The first 15-day Notice and its accompanying attachments were released on December 11, 2007.
- The second 15-day Notice and its accompanying attachments were released on February 5, 2008.
- The third 15-day Notice and its accompanying attachments were released on March 5, 2008.

The three 15-Day Notices are incorporated by reference hereinto FSOR. Each of these 15-day Notices were mailed to all parties identified in section 44(a), title 1 CCR, and to other persons generally interested in the ARB’s rulemaking concerning in-use off-road diesel vehicles. These documents were also published on December 11, 2007, on February 5, 2008, and on March 5, 2008, on ARB’s Internet site. Email messages announcing and linking to these postings were transmitted to the more than 3,300 parties who had subscribed to ARB’s “ordiesel” List Server. The 15-day Notices gave the name, telephone, and fax number of the ARB contact person from whom interested parties could obtain the complete texts of the additional incorporated documents and the modifications to the original proposal, with all of the modifications clearly indicated.

The first 15-Day Notice set forth most of the modifications presented by staff to the Board at the July 26, 2007 hearing. Pursuant to the Board’s directive the regulation was divided into several sections. Section 2449 set forth the general requirements of the regulation, including definitions, general performance requirements, flexibility provisions, and record keeping and reporting requirements. Section 2449.1 set forth the specific NOx performance requirements, and section 2449.2 set forth the specific PM performance requirements. A fourth section, adding a Surplus Off-Road Opt-in for NOx (SOON) program, was not ready for issuance and was not included in the first 15-Day Notice. Seventy-four written comments were received during the first 15-day comment period.

The second 15-day Notice included section 2449.3 and the modifications for the SOON program. The second 15-Day Notice also included additional modifications, which ARB determined were necessary in response to comments received during the first 15-Day Notice. During the second 15-Day Notice comment period, 22 written comments were received.

The third 15-Day Notice set forth additional modifications staff determined were necessary in response to comments received. During the third 15-day comment period, ten written comments were received. After review of the comments

received, ARB determined that additional modifications in response to the comments received were unnecessary.

After considering the comments received during the supplemental 15-day comment periods, the Executive Officer issued Executive Order R-08-002, adopting new sections 2449, 2449.1, 2449.2, and 2449.3 in title 13, CCR, and adopting the incorporated documents.

The following nonsubstantive changes were incorporated into the final regulation order. The amendments are shown in underline to indicate additions and strikeout to indicate deletions.

2449(c)(38)

(38) “Non-Profit Training Center” means an entity that operates a program for training in the use of off-road vehicles and qualifies as a non profit or not for profit organization under title 26 Internal Revenue Code section 501(a), (c)(3), (c)(5), or (c)(6).

2449(c)(43)

(43) “Registered and driven safely on-road” means a vehicle meets the requirements to be registered for on-road operation in Veh. Code division 3, chap. 1, article 1, sections 4000 et seq. (i.e., required to be registered or could be registered), and the requirements to be driven safely on-road in “Equipment of Vehicles” requirements in Veh. Code division 12, chap. 1, sections 24000 et seq. and “Size, Weight, and Load” requirements in Veh. Code division 15, sections 35000 et seq. Having a California Special Construction Equipment plate as defined in California Veh. Code sections 565 and 570 does not constitute registration.

2449(d)(1)(B)1.b.

b. Include such vehicle’s Max Hp times 0.2 as the Max Hp in the calculating the Target Rate, Diesel PM Index, and, as appropriate, NOx Index in sections 2449.1(a)(1) and 2449.2(a)(1), along with an Emission Factor of 0.

2449(e)(4)

(4) Special Provisions for Snow Removal Vehicles - Dedicated snow removal vehicles are exempt from the performance requirements in sections 2449(d), 2449.1(a), 2449.2(a) and 2449.3(d) but still must be labeled and reported in accordance with sections 2449(f) and (g). Dedicated snow removal vehicles need not be included when calculating fleet average indices or target rates, when determining fleet size, or when calculating the required horsepower for the BACT turnover and retrofit requirements in sections 2449.1(a)(2) and 2449.2(a)(2). Publicly owned vehicles used exclusively to support snow removal operations (such as a loader without a special snow removal Appendixattachment), but which do

not meet the dedicated snow removal vehicle definition, are exempt from the performance requirements in sections 2449(d), 2449.1(a), 2449.2(a) and 2449.3(d) but still must be labeled and reported in accordance with sections 2449(f) and (g).

III SUMMARY OF COMMENTS AND AGENCY RESPONSES TO THE ORIGINAL PROPOSAL

A. Comments Submitted Up to and at the Board Hearing

The Board received numerous written and oral comments in the formal 45-day rulemaking comment period leading up to the May and July 2007 Board meetings, beginning with the notice publication April 5, 2007, and ending with the closing of the record on July 26, 2007. A table listing all commenters is set forth below, identifying the date and form of all comments that were timely submitted. Following the table is a list of those comments that were not pertinent to the regulation, and a list of the comments that were wholly in support of the regulation.

Following those lists is a summary of each objection or recommendation regarding the proposed action, together with an agency response providing an explanation of how the proposed action has been changed to accommodate the objection or recommendation or the reasons for making no change. The comments have been grouped by topic whenever possible. Comments not involving objections or recommendations specifically directed towards the rulemaking or to the procedures followed by the ARB in this rulemaking are not summarized below. Additionally, any other referenced documents are not summarized below.

Comments Received during the 45-day Comment Period Up to and at the Board Hearing

Table III-A-1 below lists the comments received during the 45-day comment period up to and at the Board Hearing and the Reference Code assigned to each.

Table III-A-1 Comments From Up To and At the Board Hearing

Reference Code	Commenter	Affiliation	Date/Time Added to Database
AAI	Bryant, Bob	Owner, Arrow Asphalt Inc. Ripon Ca	July 18, 2007
AANESTAD	Aanestad, Brian	Aanestad, Brian	June 7, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
AAWC	Oxley, Gregg	Allen A. Waggoner Cons. Inc.	July 17, 2007
AAWC2	Oxley, Gregg	Allen A. Waggoner Const., Inc.	July 26, 2007
ABBS1	Collins, Lesli	AMERICAN BOBCAT & BACKHOE SERVICE, INC.	June 13, 2007
ABBS2	Collins, Lesli	AMERICAN BOBCAT & BACKHOE SERVICE, INC.	July 19, 2007
ACGA6	Nelson, John	Association of General Contractors/Engineering and General Contractors Association	May 25, 2007
ACL	Carlson, Eric	Associated California Loggers	June 14, 2007
ACPA	Collins, Christi	American Concrete Pumping Association	July 24, 2007
AE	Estill, John	Appian Engineering, Inc.	May 22, 2007
AFZAL	Afzal, Larry	Afzal, Larry	May 24, 2007
AGCA1	Ryan, Jim	Associated General Contractors of America	July 24, 2007
AGCA2	Holsman, Thomas	Associated General Contractors of America	July 24, 2007
AGCA3	Pilconis, Leah	Associated General Contractors of America	July 25, 2007
AGCA7	Day, Debbie	Engineering & General Contractor Association	May 25, 2007
ALA1	Weiner, Linda	American Lung Association of California	May 22, 2007
ALA2	Weiner, Linda	American Lung Association of California	July 18, 2007
ALA3	Weiner, Linda	American Lung Association of California	July 24, 2007
ALA4	Griener, Alexander	American Lung Assoc.	June 1, 2007
ALA5	Bonnie Holmes-Gen	American Lung Association of California	May 25, 2007
ALA6	Weiner, Linda	American Lung Association	July 26, 2007
ALA7	Kelter, MD,	American Lung	July 26,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
	Alex.	Association	2007
ALLEN	Allen, C. K.	Allen, C. K.	July 21, 2007
ANAIR1	Anair, Don	Anair, Don	May 14, 2007
ANDERSON1	Anderson, Joel	Assemblymember, 77th District	July 3, 2007
ANDERSON2	Anderson, Joel	California State Assembly	July 25, 2007
ANDREINI	Andreini, Mario	Contractor	May 21, 2007
ARA1	McClelland, John	American Rental Association	April 27, 2007
ARA2	McClelland, John	American Rental Association	May 17, 2007
ARA4	McClelland, John	American Rental Association	May 25, 2007
ARTBA1	Goldstein, Nick	American Road and Transportation Builders Association	May 23, 2007
ARTBA2	Goldstein, Nick	American Road and Transportation Builders Association	July 24, 2007
ASA	Daum, Skip	American Subcontractors Assn - CA	May 24, 2007
ATA1	Pohle, Timothy	Air Transport Association of America Inc	May 23, 2007
ATA3	Pohle, Tim	Air Transport Association	May 25, 2007
AWD	Davies, Lester and Rebecca	Albert W. Davies, Inc.	May 14, 2007
AYALA	Ayala, Ralph	Ayala Boring, Inc.	May 25, 2007
BALALA	Balala, Bruce	Bruce Balala Excavation	July 26, 2007
BCAQMD	Wagoner, W. James	Butte County Air Quality Management Dist	July 3, 2007
BCL	Berlaje, Bob	Big Creek Lumber Co.	July 30, 2007
BCL2	Berlage, Bob	Big Creek Lumber	July 26, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
BECC	Wells, Gwendolyn	Builders Exchange of the Central Coast	May 14, 2007
BECKER	Becker, Mike	Becker, Mike	May 21, 2007
BEHMERWOHLD	Behmerwohld, Sara	Behmerwohld, Sara	July 10, 2007
BENKER	Benker, Christopher	Benker, Christopher	July 16, 2007
BENTE	Bente, Chuck	Bente, Chuck	August 9, 2007
BERRYHILL	Berryhill, Tom	Assemblymember, 25th District	July 3, 2007
BES	Self, Michael	The Builders' Exchange of Stockton	June 1, 2007
BES2	Self, Mike	Stockton Builders' Exchange	July 26, 2007
BIA-SD1	Molloy, Scott	BIA, San Diego	May 25, 2007
BIA-SD2	Molloy, Scott	BIA SD	July 26, 2007
BIGBEAR	Tregaskis, Bruce	Big Bear Mountain Resort	May 25, 2007
BING	Bing, Keith	Bing, Keith	July 24, 2007
BKE	Kemmis, Buck	Buck Kemmis Equipment, Inc.	July 19, 2007
BMM1	Haughy, Carey	Blue Mountain Minerals	May 16, 2007
BMM2	Haughy, Carey	Blue Mountain Minerals	June 1, 2007
BMM3	Haughy, Carey	Blue Mountain Minerals	May 25, 2007
BMM3	Stevens, Ted	Blue Mountain Minerals	July 26, 2007
BNSF	Phillips, Edward	Burlington Northern Santa Fe Railway	June 1, 2007
BOLANOS	Bolanos, Liza	Liza Bolanos	May 25, 2007
BOSWELL	Boswell, Murrah	Boswell, Murrah	July 23, 2007
BOURGART	Bourgart, Jim	CA Business, Transportation, Housing Agency	May 25, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
BOWMAN	Bowman, William	bowman, william	May 17, 2007
BREATHE	Katz, Andy	Breathe California	May 22, 2007
BREATHE2	Katz, Andy	Breathe California	May 25, 2007
BREATHE3	Katz, Andy	Breathe California	July 26, 2007
BRICKLEY	Brickley, Tom	Brickley Environment	May 25, 2007
BROWND	Brown, David	Brown, David	July 19, 2007
BROWNR	brown, Robert	brown, robert	July 18, 2007
BTS1	Bellizzi, Chris	Bellizzi Tree Service(NBB)	May 22, 2007
BTS2	Bellizzi, Robert Chris	Bellizzi Tree Service	July 9, 2007
BUCKANTZ	Buckantz, Mike	Justice & Assoc.	May 25, 2007
BUSH	Bush, Charmaine	Bush, Charmaine	July 16, 2007
BYRD	Byrd, Duane	Byrd, Duane	May 11, 2007
CALCIMA	Bledsoe, Stephan	CalcIMA	June 1, 2007
CALPASC1	Wick, Bruce	California Professional Association of Specialty Contractors	May 23, 2007
CALPASC3	Wick, Bruce	California Professional Association of Specialty Contractors	May 25, 2007
CALPASC4	Louden, Dave	California Professional Association of Specialty Contractors	July 26, 2007
CALTRANS	Albright, Gregg	CalTrans	May 25, 2007
CAMARILLO1	Porcher, Dave	camarillo engineering	April 18, 2007
CAMARILLO2	Porcher, Dave	camarillo engineering	April 18, 2007
CAMARILLO3	Porcher, Dave	Camarillo Engineering Inc.	May 16, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
CAMARILLO4	Porcher, Dave	Camarillo Engineering	July 25, 2007
CAMARILLO5	Porcher, Dave	Camarillo Engineering Inc.	June 1, 2007
CAMARILLO6	Porcher, Dave	Camarillo Engineering Inc.	May 25, 2007
CAMARILLO7	Gara, Shane	Camarillo Engineering Inc.	July 26, 2007
CAMARILLO8	Porcher, Dave	Camarillo Engineering Inc.	July 26, 2007
CAN	Fox, Donna	California Nurses Association	July 30, 2007
CAN2	Fox, Donna	California Nurses Association	July 26, 2007
CAPCOA	Zeldin, Mel	California Air Pollution Control Officers Association	May 4, 2007
CAPCOA2	Quetin, Doug	California Air Pollution Control Officers Association	May 25, 2007
CAPONI	Caponi, Frank	Los Angeles County Sanitation District	May 25, 2007
CAR	Rasmussen, Charles	C.A. Rasmussen, Inc.	June 1, 2007
CAR2	Rasmussen, Taylor	CA Rasmussen, Inc.	May 25, 2007
CARDE	Koetters, Tom	Carde Pacific	May 25, 2007
CARRI	Carri, Carol	Carri, Carol	July 26, 2007
CARRUTHERS	CARRUTHERS, Spencer	CARRUTHERS, SPENCER	May 24, 2007
CARY	Cary, Ed	Cary, Ed	May 23, 2007
CATF1	Marshall, David	Clean Air Task Force et al.	May 23, 2007
CATF2	Marshall, David	Clean Air Task Force	July 23, 2007
CATF3	Lewis, Jonathan	Clean Air Task Force	July 26, 2007
CAULFIELD	Caulfield, Ryan	Caulfield, Ryan	May 15, 2007
CBC	Beecham, Craig	C. Beecham	May 15,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
		Corporation	2007
CBCC1	Lewis, Michael	Coalition to Build a Cleaner CA	June 1, 2007
CBCC2	Lewis, Michael	Coalition to Build a Cleaner CA	July 30, 2007
CBCC3	Lewis, Michael	Coalition to Build a Cleaner California	May 25, 2007
CBCC4	Michael Lewis	Coalition to Build a Cleaner CA	July 26, 2007
CBIA	Straw, Doug	CA Building Industry Assoc.	July 25, 2007
CDTOA1	Balala, Bruce	California Dump Truck Owners Association	July 22, 2007
CDTOA2	Sanchez, Daniel	California Dump Truck Owners Association	June 1, 2007
CEA	Stansell, Brian	C.E.A.	July 18, 2007
CEC	Ikenberry, Robert	CA Engineering Contractors	July 30, 2007
CEC2	Ikenberry, Robert	California Engineering Contractors, Inc.	July 26, 2007
CEI1	Hauenstein, Tom	Coastal Earthmovers, Inc.	June 18, 2007
CEI2	Lewis, Jr., Robert	Coastal Earthmovers, Inc.	July 24, 2007
CEI3	McCary, John	Coastal Earthmovers, Inc.	July 24, 2007
CER	Atkins, James	Cobra Equipment Rental Co.	May 21, 2007
CER2	Atkins, James	Cobra Equipment Rental Co.	July 26, 2007
CERA	Lyou, Joseph	California Environmental Rights Alliance	May 18, 2007
CFC	Edgar, Sean	Clean Fleets Coalition	July 26, 2007
CHAIN1	chain, steven	chain, steven	June 12, 2007
CHC	Talbert, Wilkie		July 26, 2007
CIAQC1	Lewis, Michael	Construction Industry Air Quality Coalition	May 23, 2007
CIAQC10	McCann,	Construction Industry	July 26,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
	Richard Ph.D.	Air Quality Coalition	2007
CIAQC2	Stuart, Jeb	Construction Industry Air Quality Coalition	July 9, 2007
CIAQC3	Lewis, Michael	Construction Industry Air Quality Coalition	July 24, 2007
CIAQC6	Lewis, Michael	Construction Industry Air Quality Coalition	July 25, 2007
CIAQC7	Lewis, Michael	CIAQC and CBCC	May 23, 2007
CIAQC8	Lewis, Michael	CIAQC and CBCC	July 23, 2007
CIT	Potter, Ralph	C I T Equipment Finance	May 25, 2007
CLKCS	Kip, Christopher	C. L. Kip Construction Services	June 1, 2007
CLOUD	Cloud, Jon	J. Cloud, Inc.	May 25, 2007
COADA	Coada, Kristen	Coada, Kristen	July 6, 2007
COAT	Kenneth Coat	Kenneth Coat	May 25, 2007
COGDILL	Cogdill, Dave	Senator, 14th District	June 1, 2007
COSTA	Costa, Ted	People's Advocate	July 26, 2007
COX	Cox, Dave	1st Senate District	April 27, 2007
COX	Cox, Robert	Cox, Robert	May 25, 2007
CRA	Banach, Terry	Commercial Restroom Accessories	April 30, 2007
CRS	Dahluist, John	C & R Systems	May 18, 2007
CSE	Schmollinger, Travis	Cold Steel Erectors, Inc.	July 24, 2007
CSIA	Roberts, Bob	CA Ski Industry Assoc.	May 14, 2007
CSIA2	Roberts, Bob	CA Ski Industry Assoc.	July 26, 2007
CSU-FRESNO	Stevens, Katie	California State University, Fresno	July 26, 2007
CTC	Earp, James	CA Transportation Commission	May 22, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
CURTIN	Curtin, Daniel	Daniel Curtin	July 26, 2007
CUSACK	Cusack, Michael	Cusack, Michael	July 24, 2007
CVAQC	Simunovic, Carolina	Fresno Metro Ministra, Central Valley Air Quality Coalition	July 26, 2007
DALES	Dales, Brad	Dales, Brad	May 22, 2007
DAVIES	Davies, Les	Davies, Les	June 1, 2007
DAVISR	Davis, Richard	Davis, Richard	May 17, 2007
DAVISS	Davis, Stephenie	Davis, Stephenie	May 24, 2007
DCCI	Brown, Skip	Delta Construction Co., Inc.	May 16, 2007
DCCI2	Brown, Skip	Delta Construction Co., Inc.	May 25, 2007
DCCI3	Brown, Skip	Delta Construction Co., Inc.	July 26, 2007
DD	Salawy, Aly	Delta Development	May 24, 2007
DDGE	Defty, Laura	Diamond D General Engineering	May 23, 2007
DEFOREST	DeForest, Dain	DeForest, Dain	May 25, 2007
DENHAM	Denham, Timothy	Denham, Timothy	May 31, 2007
DER1	Downs, Gordon	Downs Equipment Rentals, Inc.	June 14, 2007
DER3	Downs, Joyce	Downs Equipment Rentals, Inc.	June 1, 2007
DER4	Downs, Gordon	Downs Equipment Rentals, Inc.	May 25, 2007
DER5	Ambrose, Brant	Downs Equipment Rentals, Inc.	May 25, 2007
DER6	Downs, Joyce	Downs Equipment Rentals, Inc.	May 25, 2007
DER7	Gordon Downs	Downs Equipment Rentals, Inc.	July 26, 2007
DINEEN	Dineen-Jacinto, Stephanie	Dineen-Jacinto, Stephanie	May 16, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
DMCI	Mueller, Darryl	Darryl Mueller Construction Inc.	July 14, 2007
DORAZIO2	Dorazio, Robert	Dorazio, Robert	July 30, 2007
DOT	Albright, Gregg	Deputy Director, State of California Department of Transportation	July 26, 2007
DUVALL	Duvall, Michael	Assemblymember, 72nd District	July 24, 2007
EARL	Earl, Bob	Earl, Bob	July 18, 2007
ECA	Paine, Richard	Engineering Contractors' Assoc.	June 1, 2007
ECCO1	Rohman, Gary	ECCO Equipment Corporation	May 14, 2007
ECCO2	Schmid, David	ECCO Equipment Corporation	May 23, 2007
ECCO3	Schmid, David	ECCO Equipment Corporation	May 23, 2007
ECCO4	Schmid, David	ECCO Equipment Corporation	May 23, 2007
ECCO5	Rohman, Gary	ECCO Equipment Corporation	May 23, 2007
ECCO6	Rohman, Gary	ECCO Equipment	May 25, 2007
ECCO7	Rohman, Gary	ECCO Equipment Corporation	July 26, 2007
ECGEC	Young, William	EI Cajon Grading & Engineering Co., Inc.	July 6, 2007
ECHAMBER	Hockaday, J. Warren	The Greater Eureka Chamber of Commerce	June 1, 2007
EDC-DOT	Taylor, Kent	EI Dorado County DOT	May 29, 2007
EDWARD	Edward, Sanford	Edward, Sanford	May 15, 2007
EEI	Emmett, John	Emmett's Excavation, Inc.	July 9, 2007
ELKINS	Elkins, Larry	Elkins, Larry	May 22, 2007
ENDSLEY	Endsley, Jeff	Endsley, Jeff	May 23, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
ENVDEF	Phillips, Kathryn	Environmental Defense	June 1, 2007
ENVDEF2	Phillips, Kathryn	Environmental Defense	May 25, 2007
ENVDEF3	Phillips, Kathryn	Environmental Defense	July 26, 2007
ERNST	Ernst, Larry	Ernst, Larry	May 31, 2007
ERRECA	Erreca, Scott	Erreca's, Inc.	May 25, 2007
ESCOBEDO	Escobedo, Jose	Escobedo, Jose	May 29, 2007
EUCA1	Haas, Tara	Engineering & Utility Contractors Association	May 14, 2007
EUCA2	Ronhaar, Larry	Engineering & Utility Contractors Association	May 18, 2007
EUCA3	Alberts, Sharon	Engineering & Utility Contractors Association	May 24, 2007
EUCA5	Hass, Tara	Engineering & Utility Contractors Association	June 1, 2007
EUCA6	Hass, Tara	Engineering and Utility Contractors Association	May 25, 2007
EUCA7	Haas, Tara	Engineering and Utility Contractors Association	July 26, 2007
EVANS1	Evans, Lee	Evans, Lee	May 24, 2007
EVANS2	Evans, Robert	Evans, Robert	July 2, 2007
EXCEL1	Bendich, Ina	Excel Law Academy	May 25, 2007
EXCEL2	Pittman, Tiana	Excel Law Academy	May 25, 2007
EXCEL3	Ervin, Davillia	Excel Law Academy	May 25, 2007
EXCEL4	Caldwell, Jazmine	Excel Law Academy	May 25, 2007
FAUCHIER1	Fauchier, Dan	EGCA Magazine	April 9, 2007
FAUCHIER2	Fauchier, Dan	1 Stop Diesel Solutions, Inc.	July 18, 2007
FAUCHIER3	Fauchier, Dan	EGCA Magazine	July 26, 2007
FBA	Lewis, John	FBA	May 23,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
			2007
FCI1	Schmidt, Warren	FCI Constructors, Inc.	May 24, 2007
FCICI1	Winkle, Rodney	Franklin Construction, Inc.	May 7, 2007
FCICI2	Winkle, Rodney	Franklin Construction, Inc.	May 14, 2007
FERMA	Whalen, Mike	FERMA Corporation	July 24, 2007
FERMA2	Whalen, Mike	Ferma Corporation	July 26, 2007
FEUSNER	Feusner, Jamie	Feusner, Jamie	May 10, 2007
FISHERL	Fisher, Lorena	Fisher, Lorena	May 24, 2007
FITZGERALD	Fitzgerald, Michael	Fitzgerald, Michael	May 23, 2007
FITZSIMONS	Fitzsimons, Michael	Fitzgerald, Michael	July 17, 2007
FOSTER	Foster, Marsha	Foster, Marsha	May 15, 2007
FREETHY	Freethy, Jack	Freethy, Jack	July 17, 2007
FRESNOCITY	Stevens, Katie	Mayor Alan Autry, City of Fresno	July 30, 2007
FULLER	Fuller, Jean	Assemblymember, 32nd District	June 1, 2007
FV	Fisher, Fred	Fisher Vineyards	July 13, 2007
GAINES	Gaines, Ted	Assemblymember, 4th District	July 9, 2007
GARRETT	Garrett, Owen	Garrett, Owen	May 21, 2007
GC1	Boraston, Geoff	Granite Construction	April 27, 2007
GC2	Sbaffi, Dave	Granite Construction	May 23, 2007
GC3	Granite Construction	Granite Construction	July 25, 2007
GC4	Sabaffi, Dave	Granite Construction	May 25, 2007
GC5	Boraston, Geoff	Granite Construction	July 26, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
GCSA	Blaker, Joel	Golf Course Superintendents Association	May 21, 2007
GDB	Ballance, Lori	Gatzke Dillion & Ballance LLP	July 25, 2007
GE	Goldthwaite, Robert	owner,Goldthwaite Engineerin	July 22, 2007
GHILOTTIBC	Ghilotti, Michael	Ghilotti Bros.Contractors	May 21, 2007
GHILOTTICC	Calegari, Damon	Ghilotti Bros.Contractors	July 20, 2007
GLATKY	Glatky, Wendy	County of Los Angeles Public Works	May 23, 2007
GOLD	Gold, Ethan	Gold, Ethan	May 17, 2007
GRAFF	Graff, David	Graff, David	July 16, 2007
GREEN	Green, Clay	Green, Clay	May 22, 2007
GREINER	Greiner, M.D., Alexander	Allergy & Asthma	May 25, 2007
GROVES	Groves, William	Groves, William	July 25, 2007
GWE	Wixson, Gene	Gene Wixson Enterprises	July 22, 2007
HALL	Hall, Keith	Hall, Keith	July 17, 2007
HALLETT1	Hallett, Rebecca	Hallett, Rebecca	May 25, 2007
HALLETT2	Hallett, Rebecca	Hallett, Rebecca	June 7, 2007
HAMMOND	Hammond, Seth	Specialty Crane & Rigging	May 25, 2007
HAYWARD1	Hayward, Toby	Hayward, Toby	July 25, 2007
HBE	Hansen, Orsen	Hansen Bros. Enterprises	June 1, 2007
H-CAT	Caccioppoco, Mike	Hawthorne CAT	May 25, 2007
HCC	Adams, Jona	Harris Construction Co., Inc.	June 7, 2007
HFEC	Ehler, Fred	H. F. Ehler Company Inc.	July 10, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
HILL	Hill, Teona	McClymonds High School	May 25, 2007
HOBBS	Hobbs, James	Hobbs, James	June 22, 2007
HUFF	Huff, Bob	Assemblyman, 60th District	July 30, 2007
HUMBOLDTCO	Smith, Jimmy	Co. of Humboldt Board of Supervisors	July 6, 2007
HUSS1	Bruenke, Peter	Huss LLC	July 25, 2007
HUSS2	Bruenke, Peter	Huss LLC	July 30, 2007
HUSS3	Bruenke, Peter	Huss LLC	July 26, 2007
HYLAND1	Hyland, Matt	Hyland, Matt	July 9, 2007
INDUNI	Induni, Marta	Induni, Marta	May 1, 2007
ITA	Cross, Gary	Industrial Truck Association	May 22, 2007
IUOE1	Lea, Jane	IUOE	July 26, 2007
IUOE2	Waggoner, Wm.	I.U.O.E., Local Union No. 12	June 1, 2007
J&M	Baldwin, Bob	Jezowski & Markel	May 22, 2007
JANSSON	Jansson, Jan and Erik	Soil Retention	May 25, 2007
JEFFE	Jeffe, Doug	Transportation California	July 26, 2007
JJAI	Albanese, Kevin	Joseph J. Albanese, Inc.	May 18, 2007
JMC	Lassen, Martin	Johnson Matthey Catalysts	July 30, 2007
JMC2	Lassen, Martin	Johnson Matthey Catalysts	July 26, 2007
JOHNSON	Johnson, Burton	Johnson, Burton	May 21, 2007
JOHNSTON	Johnston, Michael	Johnston, Michael	July 24, 2007
JUNGREIS	Jungreis ,Major Jeremy	Department of Defense Installations, California	May 25, 2007
KANAYAN	Kanayan,	Kanayan, William	May 22,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
	William		2007
KEHOE	Kehoe, Christine	Senator, 39th District	June 1, 2007
KELLEY	Kelley ,Dr. Michael	Dr. Michael Kelley	May 25, 2007
KELTER	Kelter, Alex	Kelter, Alex	July 30, 2007
KIP1	Kip, Chris	Kip, Chris	July 2, 2007
KLINÉ	Kline, Brian	Owner	July 24, 2007
KOPET	Kopet, Dr. David	Dr. David Kopet	May 25, 2007
KRAUS	Kraus, Graham	Kraus, Graham	July 26, 2007
KRC	Hunter, Dennis	Knife River Corporation	April 23, 2007
KUEHL	Kuehl, Sheila James	Senator, 23rd District	June 1, 2007
LACITY	Hardison, Gretchen	City of Los Angeles, Env. Affairs Dept.	July 20, 2007
LACN	Dunham, Ken	Lumber Assoc. of CA & Nevada	June 1, 2007
LAMON	Lamon, Hank	Lamon, Hank	May 25, 2007
LAZIO	Lazio, Joseph	Lazio, Joseph	April 27, 2007
LEPE	Lepe, Felipe	President	May 25, 2007
LESLIE	Leslie, Kendal	Leslie, Kendal	July 6, 2007
LESTER	Lester, Tim	Lester, Tim	July 20, 2007
LEWISM2	Lewis, Michael	Lewis, Michael	July 30, 2007
LITTEN	Litten, Allen	Litten, Allen	July 19, 2007
LOUKIANOFF	Loukianoff, Paul	Loukianoff, Paul	July 18, 2007
LTE	Elsberry, David	LT Engineering	May 16, 2007
M3CON	McCann, Richard	M3 Consultants	May 25, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
MADGWICK	Madgwick, Lance	Madgwick, Lance	June 12, 2007
MALDONADO1	Maldonado, Abel	15th Senate District , forwarded comment from Michael Hoover, of Chicago Grade Landfill, Inc.	April 27, 2007
MALDONADO2	Maldonado, Abel	Senator, 15th District	July 25, 2007
MARGETT	Margett, Bob	State Senator, 29th District	July 24, 2007
MARTIN	Martin, Walker	Martin, Walker	May 16, 2007
MATICH	Matich, Steven	Matich Construction	July 26, 2007
MAY	May, Alia	May, Alia	May 21, 2007
MBA	Knoles , Klif	Marin Builders Association	April 27, 2007
MBUAPCD	Craft, David	Monterey Bay Unified Air Pollution Control District	May 30, 2007
MC	Johnson, Brian	Michels Corp.	June 1, 2007
MCCARTY	McCarty, John and Lisa	McCarty, John and Lisa	August 9, 2007
MCCLAUGHLIN	Dalrymple, Jerry	McClaughlin Engineering	May 25, 2007
MCCLERNON	Mcclernon, Robert	Mcclernon, Robert	July 24, 2007
MCCOY&SONS	McIntosh, Don	McCoy and Sons	May 25, 2007
MCCULLOUGH	Schuette, Paul	McCullough	May 2, 2007
MCDONALD	McDonald, Steve	McDonald, Steve	May 21, 2007
MCNALLY	McNally, Ryan	McNally, Ryan	May 15, 2007
MCORP	Mitchell, Jack	Mitchell Construction	May 22, 2007
MCQUEEN1	McQueen, Anne	McQueen, Anne	May 18, 2007
MCQUEEN2	McQueen,	McQueen, Anne	May 21,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
	Anne		2007
MCQUEEN3	McQueen, Anne	McQueen, Anne	July 19, 2007
MECA	Santos, Antonio	Manufacturers of Emission Controls Association	May 23, 2007
MECA2	Brenzy, Dr. Rasto	Manufacturers of Emission Controls Association	May 25, 2007
MICHROWSKI	Michrowski, Michael	Michrowski, Michael	May 25, 2007
MILLER	Miller, Gregg	Miller, Gregg	May 22, 2007
MILLIGAN	Milligan, Randy	Milligan, Randy	July 17, 2007
MLD	Carpenter, Mark	McMillin Land Development	June 14, 2007
MLIC	Machado, Michael	Machado Land Investment Corp.	August 9, 2007
MOSS	Moss, James	Moss, James	May 21, 2007
MSSE	Shipman, Gerald	Mid-State Steel Erectors, Inc.	May 14, 2007
MURRAY	Murray, Dick	Murray, Dick	July 17, 2007
MWS	Moorman, Larry	Moorman's Water Systems, Inc.	July 25, 2007
NBC	Svinth, Ron	North Bay Construction Inc.	May 16, 2007
NDA1	Moore, Scott	National Demolition Association	May 21, 2007
NELSON1	Nelson, John	Nelson, John	May 6, 2007
NELSON2	Nelson, John	Nelson, John	June 13, 2007
NEVADA	Spencer, John	Board of Supervisors, County of Nevada	April 27, 2007
NNC	Brusseau, Scott	Newport National Corp.	June 1, 2007
NRDC	Bailey, Diane	NRDC	July 26, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
NSAQMD	Bennitt, Gretchen	Northern Sierra Air Quality Management District	May 14, 2007
NWS1	Thomas, James	Nabors Well Services Co.	May 1, 2007
NWS3	Thomas, James	Nabors Well Services, Co.	May 25, 2007
NWS4	Thomas, James	Nabors Well Services Co.	July 26, 2007
O&M	McBeth, Rob	O&M Industries	April 27, 2007
OAKLANDENV	Gordon, Margaret	West Oakland Environmental Indicators Project	May 25, 2007
OCBC	Leathers, Kristine	Orange Co. Business Council	June 1, 2007
OE1	Prescott, Guy	Operating Engineers Local Union No. 3	April 27, 2007
OE2	Burns, Russell	Operating Engineers Local Union No. 3	April 27, 2007
OE3	Hunter, Edwin	Operating Engineers Local 12	May 24, 2007
OE4	Prescott, Guy	Operating Engineers #3	May 25, 2007
OE5	Prescott, Guy	Operating Engineers #3	July 26, 2007
OLEARY	Oleary, Lawrence	Oleary, Lawrence	May 22, 2007
OSE	Krause, Jennifer	O'Brien Steel Erectors, Inc.	May 14, 2007
P&S	Shaw, Mike	Perry & Shaw, Inc.	May 25, 2007
PALATINO	Palatino, Charles	Palatino, Charles	July 16, 2007
PATTERSON	Patterson, Kenneth	Patterson, Kenneth	July 25, 2007
PAULSELL	Paulsell, Robin	Paulsell, Robin	July 21, 2007
PB	P, B	P, B	May 19, 2007
PBL	Browning, Pat and Nita	Pat Browning Logging	May 17, 2007
PCCA	Bouzard,	PCCA	May 4,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
	Robert		2007
PILCONIS	Pilconis, Leah	Pilconis, Leah	May 23, 2007
PINETTE1	Pinette, Nicholas	Pinette, Nicholas	July 16, 2007
POHLE	Pohle, Tim	Pohle, Tim	July 25, 2007
PPC	Bowen, Richard	4 Point Pipeline Construction, Inc.	June 14, 2007
PULLMAN	Pullman, Jodi	business owner	July 22, 2007
QC	Shepard, Bob	Quinn Company	June 1, 2007
QC2	Shepherd, Bob	Quinn Power System Caterpillar Dealer	May 25, 2007
QUAN	Quan, Judi	CA Alliance for Jobs	May 25, 2007
R&J	Brizendine, Ron	Owner, R & J Enterprises	July 20, 2007
R&L	Escobedo, Jose	R&L Brosamer, Inc.	July 3, 2007
RAMP	Henn, Jessica	RAMP and CAFA	July 26, 2007
RASMUSSEN	Rasmussen, Greg	SCCA,EGCA,SANCIAQ	June 11, 2007
RATNER	Ratner, Jill	Ratner, Jill	June 1, 2007
RB	Byrne, Tim	Ritchie Bros. Auctioneers	July 30, 2007
RB2	Byrne, Tim	Ritchie Bros. Auctioneers	July 26, 2007
RCRC	Pitto, Mary	Regional Council of Rural Counties	July 9, 2007
RCRC2	Pitto, Mary	Regional Council of Rural Counties	July 26, 2007
RCRC3	Horne, Sue	RCRC	July 26, 2007
REED	Reed MD, John	Reed MD, John	May 23, 2007
REI2	Walker, Ed	Robinson Enterprises, Inc.	July 26, 2007
REYES	Reyes, Salvador	Reyes, Salvador	July 9, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
RJB1	Berry Jr., R.J.	R.J. Berry Jr., Inc.	April 27, 2007
RJB2	Berry, Mark	R.J. Berry Jr., Inc	May 23, 2007
RMMC	Johnson, Scott	Red Mountain Machinery Company	July 24, 2007
RMMC2	Johnson, Scott	Red Mountain Machinery Company	May 25, 2007
ROBINSON	Lowell Robinson	Lowell Robinson	July 26, 2007
ROCHE	Roche, Roc	Roche, Roc	May 23, 2007
ROMAN	Roman, Ken	Roman, Ken	May 23, 2007
RON SIN1	Ronsin, Dale, PE	member Society of Auto. Engineers	June 7, 2007
RON SIN2	Ronsin, Dale	Ronsin, Dale	June 1, 2007
ROPER	Roper, Ken	Roper, Ken	July 24, 2007
RORICK	Rorick, Huck	Rorick, Huck	July 16, 2007
ROSE	Rather, Jill	Rose Foundation for Communities & the Environment and Garth Team	May 25, 2007
ROSE10	Ashley Nathaniel	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE11	Bendich, Ina	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE2	Brittnie Hamilton	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE3	Le, Jackie	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE4	Khan, Irfana	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE5	McGee, Christina	Rose Foundation for Communities and the Environment	July 26, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
		Environment	
ROSE6	Pittman, Tiana	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE7	Collins, Brittney	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE8	Willingham, Danyale	Rose Foundation for Communities and the Environment	July 26, 2007
ROSE9	Bishop, Amber	Rose Foundation for Communities and the Environment	July 26, 2007
RRPI1	Peacher, Nickie	Robert R. Peacher, Inc.	May 16, 2007
RRPI2	Peacher, Nickie	Robert R. Peacher, Inc.	June 14, 2007
RTC	Beigle, Harvey	Reed Thomas Co., Inc.	July 30, 2007
RTC2	Beigle, Harvey	Reed Thomas Co. Inc.	July 26, 2007
RUMON	Rumon, Kevin	Rumon, Kevin	July 9, 2007
RUNNER	Runner, George	Senator, 17th District	June 14, 2007
SACBES	Wood, Joshua	Sacramento Builders' Exchange	July 26, 2007
SALDANO	Saldano, Lori	Assemblymember, 76th District	June 1, 2007
SALFEN	Salfen, Dion	Salfen, Dion	July 9, 2007
SBCAPCD	Dressler, Terry	Santa Barbara County Air Pollution Control District	May 14, 2007
SCAQMD	Hogo, Henry	South Coast Air Quality Management District	July 30, 2007
SCAQMD1	Wallerstein, Barry	South Coast Air Quality Management District	June 1, 2007
SCAQMD2	Elaine Chiang and , Henry Hogo	South Coast Air Quality Management District	June 1, 2007
SCAQMD3	Chang, Elaine	South Coast Air Quality Management District	May 25, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
SCAQMD4	Hogo, Henry	South Coast Air Quality Management District	May 25, 2007
SCAQMD5	Lyou, Dr. Joseph	South Coast Air Quality Management District	July 26, 2007
SCAQMD6	Hogo, Henry	South Coast Air Quality Management District	July 26, 2007
SCB	Zweifel, Don	Southern California Biofuel	July 10, 2007
SCCA1	Benton, Cash,	Southern California Contractors Assoc.	May 22, 2007
SCCA2	Benton, Cash	Southern California Contractors Assoc.	May 22, 2007
SCCA3	Davis, William E	Southern California Contractors Assoc.	July 24, 2007
SCCA5	Benton, Cash	Southern California Contractors Association	May 25, 2007
SCCA5	Davis, William E	Southern California Contractors Assoc.	July 26, 2007
SCHAAL	Schaal, Bill	Schaal, Bill	May 22, 2007
SCHULTHESS	Schulthess, Kirk	Schulthess, Kirk	May 3, 2007
SCI	Stevens, Matt	Stevens Construction Institute	July 1, 2007
SCOTTB	Scott, Brian	Scott, Brian	July 10, 2007
SCOTTR	Scott, Ronald	Scott, Ronald	April 26, 2007
SE	Seghezzi, Mike	Seghezzi Enterprises	July 9, 2007
SEC	Cash, Don	Sunstate Equipment Co.	April 11, 2007
SHANAHAN	Shanahan, Kevin	Shanahan, Kevin	May 22, 2007
SHAWM1	Shaw, Mike	Shaw, Mike	May 14, 2007
SHC1	Oakess, Thomas W.	Solar Hydrogen Company	May 24, 2007
SHC2	Oakes, T	Solar Hydrogen Company	May 24, 2007
SHC3	Oakes, PhD, Thomas W.	Solar Hydrogen Co. La Mesa, CA	July 5, 2007
SIERRACLUB1	Haller, Bill	Sierra Club, California	May 25,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
			2007
SIERRACLUB2	Aguilera, Rafeal	Sierra Club	July 26, 2007
SIEVERT1	Sievert, Steve	Sievert, Steve	July 24, 2007
SIMITIAN	Simitian, S. Joseph	State Senator, 11th District	June 14, 2007
SJVAPCD	Sadredin, Seyed	San Joaquin Valley Air Pollution Control District	May 7, 2007
SJVAPCD2	Jordan, Tom	San Joaquin Valley Air Pollution Control District	May 25, 2007
SJVAPCD3	Sadredin, Seyed	San Joaquin Valley Air Pollution Control District	July 26, 2007
SKANSKA	Bautista, Armando	SKANSKA USA Civil West Region	May 23, 2007
SLOCBE	Halls, Leslie	San Luis Obispo County Builders Exchange	May 21, 2007
SOCALMWD	Kaufman, Carol	Metropolitan Water District of So Cal	May 23, 2007
SPR	Fiske, Claude	Steve P. Rados, Inc.	May 25, 2007
SR	Hunt, Jim	Syblon Reid	May 4, 2007
STEICO1	Steigh, Michael	Steico	May 23, 2007
STEICO2	Steigh, Michael	Steico	June 15, 2007
STEIN	Stein, Nancy	Stein, Nancy	May 20, 2007
STEWART	Stewart, David	Stewart, David	July 20, 2007
STODDARD	Stoddard, Kent	Stoddard, Kent	July 20, 2007
STOWE1	Stowe, Gary	Stowe Contracting	May 16, 2007
STOWE2	Stowe, Gary	Stowe Contracting	May 17, 2007
SUKUT1	McCourt, Henry	Sukut Construction, Inc	May 14, 2007
SUKUT2	McCourt, Henry	Sukut Construction, Inc	May 24, 2007
SUKUT3	Bobeczko, Mike	Sukut Construction, Inc	May 25, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
SUKUT4	McCourt, Rick	Sukut Construction, Inc	May 25, 2007
SVBAPCC	Josiassen, Curt	Sacramento Valley Basinwide Air Pollution Control Council	June 1, 2007
T&D	Biasotti, Ray	T&D Transport/Diesel Smoketesting	May 29, 2007
TA	Wood, Becky	Teichert Aggregates	July 30, 2007
TA2	Wood, Becky	Teichert	July 26, 2007
TAYLOR	Taylor, Wayne	Taylor, Wayne	May 23, 2007
TC	Coker, Steve	T.C. Construction	May 25, 2007
TCBS	Thorton, Mark	Tuolumne Co. Board of Supervisors	July 6, 2007
TCCHAMBER	Wivell, Ty	Tuolumne Co. Chamber of Commerce	June 1, 2007
TCS	Hayet, Mike	Traffic Control Service, Inc.	July 3, 2007
TEAMSTERS	Terry, John	Teamsters Local 36	May 25, 2007
TEDRICK	Tedrick, Tom	Tedrick, Tom	June 28, 2007
TERRELL1	Terrell, William	Terrell, William	July 9, 2007
TERRELL2	Terrell, William	Terrell, William	July 19, 2007
THARP	Tharp, Jeep	Tharp, Jeep	July 9, 2007
THIBODEAU	Thibodeau, Dave	Thibodeau, Dave	May 10, 2007
TNT	Blanchard, Barry	TNT Grading Inc.	May 25, 2007
TRTC	Joslin, Richard	Truckee River Tub Company	April 27, 2007
TURNER	Turner, Michael	Turner, Michael	May 15, 2007
TURVEY	Turvey, Mark		May 15, 2007
UCS1	Anair, Don	Union of Concerned Scientists	May 17, 2007

Reference Code	Commenter	Affiliation	Date/Time Added to Database
UCS2	Anair, Don	Union of Concerned Scientists	May 23, 2007
UCS3	Anair, Don	Union of Concerned Scientists	July 24, 2007
UCS4	Anair, Don	Union of Concerned Scientist	May 25, 2007
UCS4	Lefkowitz, Kate	Union of Concerned Scientists	July 26, 2007
UCS5	Anair, Don	Union of Concerned Scientists	July 26, 2007
URKE	Urke, Alvin	Urke, Alvin	May 10, 2007
USN	Friedman, Randal	United States Navy	April 26, 2007
VADNAIS	Anderson, Jeff	Vadnais Corporation	May 16, 2007
VANHOORN	Van Hoorn, Pete	Van Hoorn, Pete	May 8, 2007
VC&M	Dietl, Bruno	Vulcan Construction & Maintenance Inc.	May 9, 2007
VCE1	Leyden, Kate	Valley Contractors Exchange	April 23, 2007
VCE2	Leyden, Kate	Valley Contractors Exchange	May 11, 2007
VEEN	Veen, Shawn	Representing Assembly Member Lori Saldana	May 25, 2007
VLAMING	Vlaming, Michael	Crane Owners Association	June 1, 2007
VPC	Carbahal, Edward	Vintage Paving Company, Inc.	May 17, 2007
WAKEMAN	Wakeman, John	Wakeman, John	July 20, 2007
WATKINSON	Watkinson, David	Watkinson, David	April 26, 2007
WATROUS	Watrous, Duane	Watrous, Duane	July 18, 2007
WC	Burke, Randall	Water Company director	June 21, 2007
WEBER	Weber, Mike	Weber, Mike	June 13, 2007
WEISS	Weiss, Mitchell	Weiss, Mitchell	May 22, 2007
WIEDEMAN	Wiedeman,	Wiedeman, Todd	July 17,

Reference Code	Commenter	Affiliation	Date/Time Added to Database
	Todd		2007
WILSON	Wilson, Tim	Wilson, Tim	July 6, 2007
WKC	Kanayan, William	William Kanayan Construction	July 13, 2007
WOOD	Wood, Don	Wood, Don	May 8, 2007
WORKER	Worker	Worker, Construction	June 4, 2007
WORKERD	Worker, Dave	Worker, Dave	May 25, 2007
WORTMAN	Wortman, Chris	Wortman, Chris	July 24, 2007
WP	Morris, John	Watersphere Plumbing owner	May 22, 2007
WPC1	Williams, Jr., John	Williams Pipeline Contractors, Inc.	July 24, 2007
WPC2	Willaims, John	Williams Pipeline Contractors, Inc.	July 30, 2007
WPC3	Williams, John H.	Williams Pipeline Contractors, Inc.	July 26, 2007
WTTC	Curtis, Whit	Whit's Turn Tree Care	May 24, 2007
YBARRA	Ybarra , Ryan	Ybarra , Ryan	July 20, 2007
YOUNG	Young, Phillip	Young, Phillip	May 23, 2007
YOW	Yow, David	for Assemblyman Joel Anderson	July 26, 2007

Of the comments above in Table III-A-1, the following Reference Codes pertain to comments that were not pertinent to the regulation:

Reference Code
BOSWELL
BOWMAN
CALTRANS
CHC
CSE
DAVISR
DAVISS

Reference
Code
HUSS
JUNGREIS
SHC1
VEEN
WIEDEMAN

Of the comments above in Table III-A-1, the following Reference Codes pertain to comments that were wholly in support of the regulation. If a comment was partially in support of the regulation but also suggested changes to the regulation, it is not included below, but is responded to in the agency responses later in this document.

Reference Code
ALA1
ALA2
ALA3
ALA4
ALA5
ALA6
ALA7
ANAIR1
BEHMERWOHLD
BOLANOS
BREATHE
BREATHE2
BREATHE3
CALCIMA
CAN
CAN2
CATF1
CATF2
CSU-FRESNO
CVAQC
DOT
EARL
ENVDEF
ENVDEF2
EXCEL1
EXCEL2
EXCEL3
EXCEL4
FEUSNER
GOLD

Reference Code
GREINER
HILL
INDUNI
JMC
JMC2
KEHOE
KELTER
KOPET
KUEHL
MECA
NRDC
OAKLANDENV
R&L
RAMP
RATNER
RCRC2
ROCHE
RORICK
ROSE
ROSE10
ROSE11
ROSE2
ROSE3
ROSE4
ROSE5
ROSE6
ROSE7
ROSE8
ROSE9
RUMON
SALDANO
SIERRACLUB1
SIERRACLUB2
SIMITIAN
SJVAPCD
STEIN
THIBODEAU
UCS1
UCS3
UCS4
UCS5
VANHOORN
VEEN
WOOD

1. Need for Emission Reductions

1. **Comment:** Your organization seems intent on trying to reduce diesel emission in California to meet targets being set by state and federal agencies. The science behind many of your assumptions is questionable in many areas, as is the actual improvements to air quality you hope to achieve. There is no doubt that reducing emissions in urban areas should improve health, but there is no evidence that reducing emissions in more rural areas will make any difference to air quality. (WATKINSON)

Agency Response: We agree that the regulation is needed to achieve the emission reductions necessary to demonstrate attainment of federal ambient air quality standards, which typically are worst in the urban areas of the state. As described further in Chapter II of the Staff Report, NOx emission reductions are needed because NOx leads to formation in the atmosphere of ozone and fine particulate matter (PM2.5).

However, the primary driver for the diesel particulate matter (PM) requirements in the regulation is not the need to attain federal air quality standards. While diesel PM emissions do contribute to ambient concentrations of PM2.5, the primary driver for the diesel PM requirements is not the need to attain the federal PM 2.5 air quality standards, but instead the need to reduce the public's exposure to the toxic effects of diesel PM. Exposure to diesel PM occurs wherever diesel vehicles are being used regardless of whether the area in which the vehicle is being used attains federal air quality standards or not, or whether the area is urban or rural. Chapter II, of the Staff Report further discusses the process in which diesel PM was identified as a toxic air contaminant, and how the Diesel Risk Reduction Plan adopted in 2000 directed ARB to reduce emissions of diesel PM to reduce risk for all Californian's throughout the state.

Overall, we believe reducing emissions in rural areas will be beneficial for air quality and provide important health benefits for three reasons. First, as mentioned above, reducing diesel PM emissions in rural areas are beneficial for people residing in these areas because diesel PM is toxic. Second, some rural areas exceed with the federal and state health based ozone and PM2.5 standards, and NOx reductions in these areas can provide some benefit to the local area by lowering local ozone and PM2.5 levels. Third, both diesel PM and NOx can be transported from rural to more densely populated downwind urban areas, thereby exacerbating poor air quality in those areas. For example, particles with a diameter range of 0.1 to 3.0 μm , with which diesel PM is principally associated, remain airborne longer (and travel farther) than smaller or larger particles due to slower dry deposition and less efficient wet deposition. Thus, emission reductions in rural attainment areas can benefit more densely populated downwind non-attainment areas. For all these reasons, staff believes it is appropriate to have the rule provisions extend to rural as well as urban areas.

Lastly, we did build provisions into the regulation for fleets that are captive to attainment areas, including many rural areas, because these areas do not have as urgent a need for NOx reductions for local air quality as urban areas. Fleets that are defined as captive attainment area fleets are exempt from all NOx requirements in the regulation. Chapter VII of the Technical Support Document contains a further description of the captive attainment area provisions.

1)a), d), f), & i) No Further Emission Reductions Needed

- 1. Comment:** The USA, and specifically California, already has far cleaner air than many countries. Why do we need to make it any cleaner? I can see the issue in certain areas such as the South Eastern parts of the states. But here in the central valley, our air is quite reasonable. A time is coming when the citizens of this state will no longer tolerate such over-regulation. (HOBBS)
- 2. Comment:** There are a number of regulations and initiatives in both California (e.g., reduced sulfur levels in gasoline) and the entire United States to reduce PM and NOx emissions. Singling out construction equipment when other comprehensive efforts are having proven success is premature and may, in fact, be unnecessary. Air quality is improving nationwide, as evidenced by the USEPA. Earlier this year, USEPA reported a decline in the overall concentration level of NOx of 41 percent since 1980 while levels of PM have declined by 30 percent (PM10) and 17 percent (PM2.5) since 1990. Further, the ARB must recognize reductions in PM and NOx levels will occur as a direct result of existing federal regulations. Dramatic improvements in emissions will come from cleaner gasoline, as well as measure affecting heavy-duty diesel engines and highway vehicles. (ARTBA1) (ARTBA2)
- 3. Comment:** I grew up in Covina, California from 1968 to 1991. The smog was so thick that we would regularly have third stage smog alerts. Thirty years later, with the population doubled, we only have one to two first stage smog alerts a year. We have made tremendous progress towards cleaner air. Why can't we now set a pace that is workable to all affected by these new regulations? (RASMUSSEN)
- 4. Comment:** Voluntarily the company I've been working for, for 20 years, has been very progressive. We've accomplished a lot of improvement in our fleet and have reduced our emissions significantly. If you let the contractors work voluntarily and go the way they were instead of waiting for Tier 4 engines to become available, a lot of good improvements will occur naturally. (SPR)

- 5. Comment:** Concerning pending legislation on requiring radical and costly upgrades to off road diesel vehicles - show me the science of the present danger. (OLEARY)
- 6. Comment:** I thought that the State estimated that off-road diesel powered construction equipment accounted for less than 1% of the diesel particulate matter pollution and 9% of the oxides of nitrogen pollution in the state. (RJB2)
- 7. Comment:** I am concerned that this industry is bearing more of the cost to reduce those emissions than they are actually putting in. (EUCA7)
- 8. Comment:** Killing the construction industry is not going to stop air quality problems. The small amount of diesel engines that this regulation affects is not the solution to the problem. (AFZAL)

Agency Response: As discussed in Chapter VI of the Technical Support Document, off-road vehicles are a significant source of diesel particulate matter, as well as NOx emissions that lead to ozone and ambient PM. The regulation is projected to affect approximately 180,000 vehicles (year 2005 population), which currently emit about 386 tons per day of NOx emissions and 23 tons per day of PM emissions. Statewide, this represents nearly a quarter of the total PM emissions from mobile diesel sources and nearly a fifth of the total NOx emissions from mobile diesel sources. Although increasingly stringent new engine standards are reducing emissions from off-road diesel vehicles over time, because of their durability, most vehicles operate for several decades before being retired. Thus, emissions from in-use off-road diesel vehicles will continue to present significant health impacts, as described in the Staff Report, for many years to come without this regulation. Most importantly, diesel PM is a primary contributor to several adverse health impacts, including an estimated 70 percent of all cancer risks from TACs.

Although emissions would trend naturally down without this regulation as the fleet gradually turned over to newer, cleaner engines, these reductions are not sufficient for many areas of the state to meet clean air standards. In fact, without reductions from this large source category, the South Coast and San Joaquin Valley will be unable to attain federal ambient air quality standards. Because of this, the proposed regulation accelerates this necessary reduction in emissions.

Under the federal Clean Air Act (CAA), the U.S. Environmental Protection Agency (U.S. EPA) has established National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health, including fine particulate matter (PM2.5) and ozone. Areas in the State that exceed the NAAQS are required under federal law to develop State Implementation Plans (SIPs) describing how they would attain the standards by certain deadlines. NOx emission reductions are needed because NOx leads to formation in the

atmosphere of both ozone and PM2.5; diesel PM emission reductions are needed because diesel PM contributes to ambient concentrations of PM2.5.

Currently, the South Coast and San Joaquin Valley SIPs have been submitted to U.S. EPA , which demonstrate attainment of the federal 8-hour ozone standard by 2024. To attain the federal ozone standard, the South Coast will need NOx reductions of nearly 90 percent from 2006 levels. Similarly, the San Joaquin Valley will need to reduce NOx emissions by 80 percent. The magnitude of NOx emission reductions needed is such that already adopted federal and state measures, such as those cited in the comment from (ARTBA1) (ARTBA2) above, are nowhere near adequate to attain the standards on time.

With respect to the federal PM2.5 standard, neither the South Coast nor the San Joaquin Valley is in attainment for the PM2.5 NAAQS. The South Coast has submitted a SIP which demonstrates attainment of that standard by 2014, after achieving reductions in NOx of 55 percent and 15 percent for PM2.5, both from 2006 levels. The San Joaquin Valley is in the process of developing a PM2.5 SIP, which is also expected to demonstrate attainment of the federal PM2.5 standard by 2014. ARB and San Joaquin Valley Air Pollution Control District staffs estimate that to attain the federal PM2.5 standard, NOx emissions need to be 50 percent lower than baseline levels and PM2.5 emissions need to be reduced by 25 percent.

Because the standard is an annual average, U.S. EPA requires that all necessary emission reductions be achieved one calendar year ahead of the attainment deadline, or by 2014. While all sources of NOx emissions are important, off-road diesel vehicles are one of four major categories that will determine whether California is able to meet the 2014 deadline for PM2.5 attainment in the South Coast Air Basin. Staff does not believe that the industries affected by the in-use off-road diesel vehicle regulation will be bearing more than their share of the cost to attain the NAAQS. As described above, vehicles affected by the regulation are responsible for nearly a quarter of the total PM emissions from mobile diesel sources and nearly a fifth of the total NOx emissions from mobile diesel sources. Also, as described in Chapter XI of the Technical Support Document, the yearly costs of the regulation are significantly less than the value of the construction industry, and it is expected that the regulation would not have a significant impact on the total value of construction. Perhaps more importantly, ARB staff estimates that the health benefits to California of this regulation exceed the costs by over 5 to 1. According to Chapter I and Chapter VII of the Staff Report, the regulation will provide health benefits of between \$18 billion and \$26 billion at a cost of between \$3.0 and \$3.4 billion.

1)b) Enough Improvement with Introduction of Tier 3 and 4 Engines

- 1. Comment:** Why not let the equipment phase itself out? It won't last forever. (FOSTER)

- 2. Comment:** New emission standards will phase in cleaner equipment naturally so there is no need for this regulation. CARB staff admits that normal industry equipment replacement cycles will achieve the same emission results as their pending regulation, but just take longer. We agree. (EUCA1)
- 3. Comment:** According to the fact sheet “Emissions and health benefits of proposed regulations for the in-use off-road diesel vehicles” on the ARB’s website, PM and NOx levels are projected to decline significantly even without this regulation. (J&M)
- 4. Comment:** Despite acknowledging that the industry’s emissions would reach their goals through the natural process of equipment replacement, staff persisted in using a command-and-control approach, annual targets and brutal punishment for failure to comply. Your staff, the environmental community and the industry all agree that new generation construction equipment, added to our fleets during the normal course of equipment replacement will achieve virtually the same emission reductions, particularly in terms of NOx. Normal replacement cycles will achieve a 75 percent reduction in particulate matter—the reason why we started on this adventure in the first place. It is clear that we will meet the NOx requirements without any regulation at all; this portion of the rule will cause the greatest damage to our industry. This damage will come from the requirement to replace, repower or retire eight percent of the fleet each year until 2015 and ten percent per year thereafter. This is 400 to 500 percent acceleration from our normal replacement cycle. (SCCA3)

Agency Response: While staff agrees that NOx and PM emissions are projected to decrease, even in the absence of the regulation, from now through 2020 due to the normal attrition of older engines that are replaced with new engines (which are certified to the increasingly stringent off-road new engine standards), this rate of decline is not sufficient to meet California’s emission reduction goals. As such, the regulation is necessary to accelerate the anticipated emission reductions from off-road vehicles. For example, as described in Chapter VI of the Staff Report, the PM emission inventory projected for 2020 with the regulation in place would not be reached in the absence of the regulation until after 2025, or more than five years later.

However, staff believes that accelerating these additional emission reductions during the timeframe proposed in the regulation is justified because of the significant health benefits that are associated with reductions in diesel PM and NOx emissions, as described in Chapter VI of the Staff Report, and because these emission reductions will not be achieved through normal turnover of vehicles to those meeting the new the off-road engine standards alone. As described in Chapter IV of the Staff Report, these health benefits include, among other benefits, the prevention of 4,000 premature deaths.

Additionally, reducing emissions from in-use off-road diesel vehicles is also necessary to meet federally imposed clean air standards. Failure to meet federal clean air standards in time to meet federally mandated deadlines could result in the imposition of sanctions that could impact the State's infrastructure improvement efforts through the withholding of federal transportation dollars.

A more detailed discussion on why staff does not believe it is sufficient to impose requirements solely on the engine makers can be found in Chapter III-A-6 of this FSOR in the response in section III-A-6)a)i).

1)c) Doubting Diesel PM Health Risk

1. **Comment:** I think we should test all the contractors and their families for diesel particulate matter. How can we do that? (RRPI1)
2. **Comment:** I am concerned with the validity of the statistics noting that Federal Air Quality Standard non-attainment areas have lower asthma rates and death rates due to chronic lower respiratory disease than attainment areas. (DCCI)
3. **Comment:** The legitimacy of the health risk associated with exposure to diesel exhaust has not been established. I doubt that diesel PM causes or exacerbates asthma. (TNT) (OLEARY) (MCNALLY) (DMCI)
4. **Comment:** Since life on earth is carbon-based, carbon can hardly be considered a pollutant. (LAZIO)
5. **Comment:** ARB should postpone any vote on the regulation before the health risk has been qualified by the medical community and pollution from common dust, rain forest burning and pollution from countries outside our borders can be mitigated. (STEICO1)
6. **Comment:** Medical statistics based on models have little relevance unless genetic predisposition to a cited illness is taken into consideration. No one can prove or disprove the 4,000 deaths or the cited reduction in hospital admissions, or how long these factors will be postponed if this regulation is enacted as written. (FERMA)
7. **Comment:** It has not been made clear that this rule is going to save 4,000 lives over the duration of the entire rule, not 4,000 annually. (DER7)

Agency Response: Diesel engines emit a complex mix of pollutants, the most visible of which are very small carbon particles or "soot", known as diesel PM. Diesel exhaust also contains over 40 cancer-causing substances, most of which are readily adsorbed on the soot particles. In 1998, California identified diesel PM as a toxic air contaminant based on its potential to cause cancer, premature

death, and many other health problems. In addition, several international and national health agencies have concluded that diesel exhaust has the potential to contribute to cancer and other health effects. These agencies include the National Institute of Occupational Safety and Health (1988), the International Agency for Research on Cancer (1989), the World Health Organization (1996), the National Toxicology Program (2000) and the U.S. EPA (2002). Overall, diesel engine emissions are responsible for a majority of California's estimated cancer risk attributable to air pollution. Diesel emissions pose a significant health risk due to various factors, which include the following:

- Diesel PM is often emitted close to people so high exposures often occur
- Diesel PM readily deposits in the lung and can be absorbed in the body
- Diesel PM contains compounds known to damage DNA and cause cancer

The health risk assessment conducted by staff for this proposed regulation is a valid characterization of the potential risks associated with exposures to diesel PM and NOx from in-use off-road diesel vehicles. The accuracy and validity of the diesel PM cancer risk factor based on epidemiological and toxicological data and related findings and opinions of U.S. EPA and others are thoroughly discussed in the references cited in the Technical Support Document. It was neither the intent nor purpose of the Technical Support Document to reproduce these lengthy discussions. Specifically, the ARB and the Office of Environmental Health Hazard Assessment (OEHHA) documents, Proposed Identification of Diesel Exhaust as Toxic Air Contaminant, and Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles address the toxicity and validity of health values regarding diesel PM. No alternative data was presented to staff that changes this basis. The preponderance of scientific evidence clearly links diesel PM with increased cancer risks. Unfortunately, it is not feasible to test everyone who is exposed regularly to diesel PM.

As described in Chapter IV of the Technical Support document, diesel PM is a major contributor to potential ambient risk levels. Using the cancer unit risk factor developed by OEHHA for the TAC program, it was estimated that for the year 2000, exposure to ambient concentrations of diesel PM (1.8 µg/m³) could be associated with a health risk of 540 potential cancer cases per million people exposed over a 70-year lifetime. This diesel PM cancer risk accounted for approximately 70 percent of the total risk associated with all known ambient air toxics.

Emissions of NOx and ROG are precursors to the formation of ozone in the lower atmosphere. According to the Technical Support document, off-road diesel engines contribute a substantial fraction of ozone precursors, particularly NOx, statewide. Therefore, reductions in NOx from off-road diesel engines are a considerable contribution to California's efforts to reduce exposure to ambient ozone. Controlling emissions of ozone precursors reduces the prevalence of the health effects associated with ozone exposure, such as coughing, chest

tightness, inflammation and irritation of the respiratory tract, worsening of wheezing and other asthma symptoms, and reduced lung function, and would reduce hospital admissions and emergency visits for respiratory problems. According to the Staff Report, approximately 4,000 premature deaths (1,100 – 6,800, 95 percent confidence interval (95% CI)) statewide would be avoided by the year 2030 from the implementation of the proposed regulation. It is not possible to confirm these numbers upon every death suspected to result from exposure to diesel PM.

Diesel PM is a contributing factor to premature death from heart and/or lung diseases, based on studies of over 500,000 people (Pope et al., 1995, 2002), and independently verified with a reanalysis requested by industry and the U.S. Congress (Krewski et al., 2001). Average life expectancy was reduced by about 1.5 years, comparing the cities with highest and lowest high diesel PM levels (Brunekreef, 1997). This translates to a loss of about 14 years of life for people who died from diseases associated with diesel PM exposure (USEPA, 1999). These studies serve as the basis for PM air quality standards by ARB, U.S. EPA, the World Health Organization guidelines for Europe, and other countries. Specific studies that link motor vehicle-related PM exposure to premature death include:

- Elderly people living near major roads had almost twice the risk of dying from cardiopulmonary causes (Hoek et al., 2000).
 - PM from motor vehicles was linked to increased mortality (Tsai et al., 2000).
 - Fine PM (PM_{2.5}) from mobile sources accounted for three times the mortality as did PM_{2.5} from coal combustion sources (Laden et al., 2000).
- 8. Comment:** There was a panel review by nine experts of the Pope and Dockery study in 2006 that was the basis for much of the analysis done by the staff. Those experts were unanimous in saying that there was no way to quantify the emission reductions benefits, that there is evidence that PM emissions cause increased mortality and morbidity, but there's no ability to put numbers on it. So that any estimates that you see are, in fact, not supportable by any of the science at this present moment. (CIAQC10) (LEWISM2)
- 9. Comment:** The ARB Staff has presented an estimate of the economic health benefits from the emission reductions to be realized from the proposed in-use off-road diesel vehicle regulation of \$18 to \$26 billion. However, the Staff analysis is seriously flawed in several key respects and the Staff has overreached the ability both to estimate changes in morbidity and mortality and to place a value on those changes.

The Staff relied on a series of studies, culminating in a meta-analysis across 500 studies (Pope & Dockery 2006). The Staff did not include a subsequent

review by a panel of experts published by the same journal that calls into question the ability to quantify the effects of PM emission reductions (Chow et al 2006).

In addition, a recent estimate of the value of a statistical life (VSL) published in the premier environmental economics journal shows conclusively that the VSL decreases with age in contrast with the assumption embedded in the Staff's analysis (Viscusi & Aldy 2007).

Finally, the Staff failed to account for the fact that the emission reduction benefits are short-lived which contradicts the premise of the studies on which the Staff's analysis is based; and to net out the increase in mortality and morbidity in other states from the compensating increased use of Tier 0 and I equipment in neighboring states assumed in the Staff's compliance cost analysis.

As a result, no valid estimate of the benefits from the emission reductions can be made based on the current state of knowledge.

Even if the Staff could make a reasonable estimate of the mortality and morbidity benefits, it has failed to update its analysis for recent work that indicates that the VSL is not constant as individuals age. In a recent article, Viscusi & Aldy 2007 found that the VSL for the age 55-62 years-old cohort is 58% lower at \$3.8 million than the peak of \$9 million in the age 35-44 cohort! Given that the effects from PM reductions are unlikely to be distributed evenly across age groups, this could have a significant impact on the benefit estimates.

Both the estimates of reductions in mortality and morbidity and the associated economic valuations rely on the premise that the relevant emission reductions are a permanent reduction from current levels in perpetuity. In other words, the estimates assume that emissions have been at one constant level and are being lowered to another constant level. However, the proposed regulation will only lower emissions temporarily, with the inventory converging in 2030 with that under the current regulations.

Comparing the PM emission paths under the current and proposed rules, we find that the emission reductions are shifted forward an average of 5.7 years in the 2010 to 2030 time period. Given that these reductions would have occurred in any case, the maximum gain in expected lifetime can be no greater than 5.7 years.

Yet the studies that the Staff relies on to estimate changes in mortality and morbidity are largely cross sectional. These imply that the change in life expectancy is the average for the population (roughly 77 years) minus the average age of the population experiencing premature deaths and morbidity (probably about 31 years). Thus the reduction in life expectancy implied in these studies is closer to 40 years, or six to eight fold that which might be produced by adopting the proposed rule. For this reason, the Staff has grossly overestimated the improved mortality and morbidity rates.

This issue also is salient in valuing changes in these rates. The VSL studies typically rely on labor market surveys in which the oldest of the cohort is 62 years old. Even the oldest workers have at least 15 more years of life expectancy, and the average is probably in excess of 30 years. Thus, the VSL relies on a very large reduction in life expectancy. The studies do not have the resolution to estimate a change of 6 years or less in life expectancy. Given that Viscusi & Aldy 2007 find that the VSL declines with age, the analysis must be adjusted for the large discrepancy between the risk reduction created by the proposed rule and the risk reductions upon which the valuation method is based.

This shift in the rates also arises when considering any proposed changes in the regulation. Everyone will die eventually, so any debate about the potential effects is not about increased deaths, but rather about decreased life expectancy. Thus, we cannot reasonably estimate a comparable change in premature deaths from a shift in the emission path.

The Staff in its cost compliance studies has insisted that 1) California can meet its targets by purchasing used equipment in the higher Tiers from other states and 2) California firms can offset their costs by selling their used equipment to other states. If California is buying newer used equipment from other states, those states will have to retain theft older equipment for longer periods, and if California is selling its older used equipment to those states, then the population of Tier 0 and Tier 1 vehicles will increase in those states. In any case, NOx and PM emissions will increase in those states. That implies that while emissions will go down in California, emissions will increase by some commensurate amount elsewhere.

Yet, the Staff also relies on studies such as Pope & Dockery 2006 that show that changes in PM emissions have linear health impacts (i.e., one-for-one) with no minimum threshold. So an increase in emissions in other states will lead to an increase on mortality and morbidity in those states regardless of their current emission levels. In other words, the health benefit estimates must be offset by the increased emission costs in other states if the ARB is to take a truly holistic, rather than legalistic, approach to rulemaking.

The Staff has not prepared an analysis that shows what proportion of California's fleet is likely to be sold out of state, nor what portion of other states' fleets will be retained for a longer period as a result of this rule. Without this analysis, we cannot determine by how much the Staff has overestimated the expected health benefits from the proposed rule. (LEWISM2 – Review of the Health Benefit Estimates from Emission Reductions in the Construction Fleet by Richard J. McCann, Ph.D., July 2007)

Agency Response: The commenter appears to be suggesting that due to various sources of uncertainty surrounding estimates of mortality and morbidity,

any attempts at quantification of these impacts are invalid. Staff disagrees with this assessment. The methodology used to quantify health impacts was the same as that used in the Emission Reduction Plan for Ports and Goods Movement in California (ARB 2006),² which was peer reviewed by ten nationally known experts in the fields of emissions inventory development, air quality and exposure, health impacts quantification, and economic valuation. This document was released for public comment in March, 2006 and approved by the Board in April, 2006. Moreover, all concentration-response functions used in this document were derived from peer-reviewed scientific publications. Also, several features of the methodology were from “Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines” (U.S. EPA 2004)³ and were previously peer reviewed by the U.S. EPA’s Scientific Advisory Board. In addition, ARB has been using the methodology for quantifying the health benefits associated with implementing airborne toxic control measures to reduce diesel PM since 2003 (ARB 2003a⁴, 2003b⁵, 2003c⁶, 2004a⁷, 2004b⁸, 2004c⁹). Peer-reviewed publications on the health effects of exposure to PM2.5 have shown statistically significant relationships between PM2.5 exposures and adverse health impacts, even when the models used accounted for other confounding factors, including co-pollutants. Hence, Staff feels that the scientific basis for the methodology is sound and scientifically defensible. Furthermore, health impact calculations for the current regulation included uncertainty ranges, to acknowledge and account for potential sources of variability surrounding the numbers.

² California Air Resources Board (ARB). 2006. Technical supplement. Quantification of the health impacts and economic valuation of air pollution from ports goods movement in California.

³ U.S. EPA, 2004. United States Environmental Protection Agency. May, 2004. Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines. EPA-420-R-04-007. Office of Transportation and Air Quality.

⁴ ARB 2003a. California Air Resources Board. Staff Report: Proposed Diesel Particulate Matter Control Measure For On-Road Heavy-Duty Residential and Commercial Solid Waste Collection Vehicles, available at

<http://www.CARB.ca.gov/regact/dieselswcv/isor3.pdf>. (2003)

⁵ ARB 2003b. California Air Resources Board. Staff Report: Proposed Airborne Toxic Control Measure For In-Use Diesel-Fueled Transport Refrigeration Units (TRU) And TRU Generator Sets, And Facilities Where TRUs Operate, available at <http://www.CARB.ca.gov/regact/trude03/isor.pdf>. (2003)

⁶ ARB 2003c. California Air Resources Board. Staff Report: Airborne Toxic Control Measure For Stationary Compression-Ignition Engines, available at <http://www.CARB.ca.gov/regact/statde/isor.pdf>. (2003)

⁷ ARB 2004a. California Air Resources Board. Staff Report: Proposed Modifications To The Fleet Rule For Transit Agencies And New Requirements For Transit Fleet Vehicles, available at <http://www.CARB.ca.gov/regact/bus04/isor.pdf>. (2004)

⁸ ARB 2004b. California Air Resources Board. Staff Report: Airborne Toxic Control Measure For Diesel-Fueled Portable Engines, available at <http://www.CARB.ca.gov/regact/porteng/isor.pdf>. (2004)

⁹ ARB 2004c. California Air Resources Board. Staff Report: Proposed Regulatory Amendments Extending the California Standards for Motor Vehicle Diesel Fuel to Diesel Fuel Used in Harborcraft and Intrastate Locomotives, available at <http://www.CARB.ca.gov/regact/carblohc/isor.pdf>. (2004)

McCann bases his argument regarding the validity of staff's estimated health benefits by raising objections to the discussion by Pope & Dockery (2006)¹⁰, which he cites as a key publication upon which ARB staff based their methodology. However, Pope & Dockery's paper was published subsequent to ARB staff's adoption of its methodology and so was not a study on which Staff's methodology was based. McCann supports his argument by citing Chow et al. (2006)¹¹ to invalidate conclusions reached by Pope & Dockery (2006). The publication by Chow et al. (2006) did not contain new results. Rather, it was a review that consisted of comments and personal opinions from invited and contributing authors; the commentaries were generally in agreement with Pope and Dockery's findings.

With regard to the threshold issue, McCann claims that a mathematical functional relationship that is linear with no minimum threshold is not supported by the literature. This issue is not relevant because ARB staff employed a non-linear concentration-response function to estimate the health impacts associated with diesel PM exposures and developed "tons-per-case" health factors based on emissions that are specific to each air basin.

Shipping Tier 0 and Tier 1 Equipment to Other States Will Offset Gains in Health Benefits

McCann notes the possibility that some of California's older equipment will be sold to people in other states, or that older equipment will be retained in other states. Thus, he speculates that mortality and morbidity will increase in these states. While the ARB is not unconcerned by the potential health impacts of Tier 0/1 vehicles exported from California, such impacts are beyond the scope of the regulatory impact analysis. The goal of the regulation is to reduce emissions of diesel particulate matter (diesel PM) and oxides of nitrogen (NOx) from in-use, off-road diesel vehicles in California. Staff's benefit calculations accurately reflect the scope of the regulation. What may or may not occur in other states as a result of the regulation does not diminish the accuracy of Staff's estimate of the regulation's health benefits to Californians.

While it is possible that the regulation may result in the export of a limited number of Tier-0/1 vehicles to other states, it is far from certain that such exports would increase total diesel PM emissions in those states. Out-of-state purchases of California's used Tier-0/1 vehicles may simply substitute for purchases of comparable used vehicles from competing sellers in other states. McCann offers no basis for his assumption that the regulation would increase total out-of-state purchases of higher-emitting vehicles. Similarly, the commenter provides no evidence for his assertion that the sale of lower-emitting used vehicles to

¹⁰ Pope CA, III & Dockery DW. 2006. Health effects of fine particulate pollution: lines that connect. J. Air & Waste Manage. Assoc. 56:709-742.

¹¹ Chow JC et al. 2006. Critical review discussion: Health effects of fine particulate pollution: lines that connect. J. Air & Waste Manage. Assoc. 56:1368-1380.

California operators will force other states to retain older equipment for longer periods. On the contrary, the history of air pollution regulation shows that California emission standards are frequently adopted by other states and nations, leading to substantial additional health benefits beyond California's borders.

In summary, McCann does not provide supporting evidence for his assertion, and it is not clear how the export of Tier-0/1 vehicles might cause overestimation of health benefits in California since the benefits were estimated based on emissions reductions that would occur in California.

Economic Benefit Estimates Are Not Consistent with Current Knowledge

Contrary to the assertion that VSL decreases with age, ARB Staff's benefits calculations include no assumptions regarding the relationship between age and the value of statistical life (VSL). Rather, Staff's benefits analysis uses an age-independent VSL to value mortality risk reductions - according to conventional usage and the SAB's most recent recommendation.

On October, 12, 2007, the U.S. Environmental Protection Agency Science Advisory Board (SAB) released its final "Advisory on EPA's Issues in Valuing Mortality Risk Reduction."¹² The SAB's report concluded that, "Although the literature on the relationship between age and the VSL is growing, the Committee does not believe that it is sufficiently robust to allow the Agency to use a VSL that varies with age." In addition, the SAB report recommends, "that at present the Agency use an age-independent VSL to value mortality risk reductions."

ARB staff has followed the work of the SAB's advisory on valuing mortality risk reduction and places a high degree of confidence in its members' knowledge and abilities, and in the thoroughness of its deliberative process. The SAB is a public advisory committee providing extramural scientific information and advice to the Administrator and other officials of the Environmental Protection Agency and is structured to provide balanced, expert assessment of scientific matters related to problems facing the Agency.

Its findings on the topic of Life Expectancy and Mortality Risk Valuation were reached by a panel of 11 eminent economists after more than two years of research and deliberation, including the review of recent (2006¹³ and 2007¹⁴) papers by Kip Viscusi and Joseph Aldy on the topic of age and the VSL.

¹² Please see [SAB Advisory on EPA's Issues in Valuing Mortality Risk Reduction](#). (PDF, 23 pp., 197,673 bytes) EPA-SAB-08-001. The report is available here:

<http://yosemite.epa.gov/sab/sabproduct.nsf/WebReportsbyYearBOARD!OpenView>

¹³ Aldy, Joseph E. and W. Kip Viscusi (2006). "Adjusting the Value of a Statistical Life for Age and Cohort Effects," Resources for the Future Discussion Paper 06-19. [Review of Economics and Statistics, forthcoming.]

¹⁴ Aldy, Joseph E. and W. Kip Viscusi (2007). "Age Differences in the Value of a Statistical Life: Revealed Preference Estimates," Review of Environmental Economics and Policy 1(2): forthcoming.

The commenter further asserts, that the VSL used in staff's benefit calculations, "depends on a very large reduction in life expectancy." Because ARB staff uses an age-independent VSL, as discussed above, no assumptions regarding the life expectancy of the regulation's beneficiaries are embedded in staff's valuation method. Hence, the assertion is incorrect.

10. Comment: When diesel PM was identified as a toxic air contaminant (TAC) diesel particulate was used as a surrogate to estimate the health risk for human exposure to whole diesel exhaust (e.g., solid particulate and reactive organic compounds). During the Railway study, filters were used to collect solid particulate and the data was used to develop the diesel PM cancer potency factor. However, we do not have sufficient test data to know whether the risk is driven by exposure to solid particulate or the various air toxics that are released in gaseous form, or the relative contribution to the total risk from the organic compounds and solid particulate. The organic portion may be significant and, then, simply adding a diesel particulate filter may miss a significant portion of the health risk from exposure whole diesel exhaust. In other words, simply reducing the solid particulate will not necessarily result in a proportional reduction in cancer risk. (MBUAPCD)

Agency Response: This rulemaking is aimed at addressing the risk from diesel PM and so our direction and legal responsibility is to reduce it. This rulemaking is not the appropriate forum to address whether there are other gaseous air toxics (e.g., acrolein) present in diesel exhaust. Acrolein, which has also been established as a toxic air contaminant, is being addressed separately. ARB believes that it is sufficiently health protective to design diesel PM regulations around the diesel PM cancer impacts. The diesel PM cancer tends to be the driver in most situations. There may be some situations based on receptor proximity and meteorology where the acute noncancer Hazard Index (HI) for acrolein is above 1. But given site specific nature of these situations, the high level of uncertainty in acrolein emissions estimates, the less dramatic health endpoint for acrolein (eye, respiratory irritation) versus diesel particulate matter (increase in lung cancer risk, heart and lung disease, premature death, asthma attacks, and acute bronchitis), and the fact that the acrolein reference exposure level (REL) is currently being reevaluated by OEHHA, we do not believe it appropriate to design diesel PM regulations based on acrolein impacts. All the Air Toxic Control Measures that ARB has adopted to implement the Diesel Risk Reduction Plan have been designed around BACT in consideration of the diesel PM cancer risk. Further, ARB staff has cautioned the local air districts about making permitting and California Environmental Quality Act decisions based on acrolein HIs.

Lastly, any comments regarding regulations that have been adopted and are in the proposal process, are addressed in Chapter 18 in the Final Statement of

Reasons. Any regulations outside of California's borders are beyond the regulatory authority of ARB.

The references mentioned below were not relied upon in the rulemaking for the in-use off-road diesel vehicle regulation but are cited in the responses above.

- Brunekreef B. Air pollution and life expectancy: is there a relation? *Occ. Environ. Med.* 54:781-784, 1997.
- Hoek G, Brunekreef B, Goldbohm S, Fischer P, van den Brandt PA. Association between mortality and indicators of traffic-related air pollution in the Netherlands: A cohort study. *Lancet* 360:1203-1209, 2002.
- Krewski D, Burnett R, Goldberg MS, Koover K, Siemiatycki J, Jerrett M et al. Reanalysis of the Harvard Six Cities Study and the American Cancer Society Study of particulate air pollution and mortality. Research Report of the Health Effects Institute, 2001.
- Laden F, Neas LM, Dockery DW, Schwartz J. Association of fine particulate matter from different sources with daily mortality in six U.S. cities. *Environ. Health Persp.* 108: 941- 947, 2000.
- Pope CA, Thun MJ, Namboodiri MM, Dockery DW, Evans JS, Speizer FE, Health CW. Particulate air pollution as a predictor of mortality in a prospective study of U.S. adults. *Am. J. Respir. Crit. Care Med.* 151:669-674, 1995.
- Pope, CA, Burnett RT, Thun MJ, Calle EE, Krewski D, Ito K, Thurston G. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *JAMA*. 287: 1123-1141, 2002.
- Tsai FC, Daisey JM, Apte MG. An Exploratory analysis of the relationship between mortality and the chemical composition of airborne particulate matter. *Inhalation Toxicology* 12 (Supplement 2): 121-135, 2000.

1)d) See above

1)e) This section was left intentionally blank

1)f) See above

1)g) My Engine Does Not Pollute

1. **Comment:** We have a 49 hp Deutz engine on a trencher that we use occasionally. We cannot afford the loss of this unit. It does not pollute. It does not emit fumes like a diesel bus – it is clean enough to operate all day without any side effects from emissions. (MWS)

Agency Response: Staff disagrees. While it is unclear what the age of the cited trencher is, even the newest 49 hp engine, which meets the current Tier 2 standards, emits at approximately the levels below:

- New 2007 engine for NOx - 4.88 grams per brake horsepower hour (g/bhp-hr)
- New 2007 engine for PM - 0.35 g/bhp-hr

The levels shown above represent the emissions levels that a new Tier 2 engine cannot exceed in order to be certified by ARB for sale in California. For each hour of operation, a new 2007 49 hp Tier 2 engine could emit up to 179 grams of NOx and 13 grams of PM.

Although these emissions may not always be visible or evident to the equipment operator (diesel PM is often of a diameter that is invisible to the naked eye), they are nonetheless significant. The health effects of pollution from diesel engines are described further in Section D of Chapter IV of the Technical Support Document.

While it is true that the emissions are lower than those of older engines, they are not zero, and are not as clean as engines that will be produced in the near future. We believe that it is likely that the commenter's trencher is not brand new, and therefore most likely emits at levels that are greater than those listed above.

In developing the regulation, staff did acknowledge that vehicles that are used less are not as cost-effective to clean-up as vehicles see higher use. In recognition of this, the regulation has provisions for low-use equipment that operates less than 100 hours per year. If the trencher cited above is truly used only occasionally, it may qualify for the low-use exemption.

1)h) This section was left intentionally blank

1)i) See above

1)j) Diesel Risk Reduction Plan Too Old

1. **Comment:** Why is it acceptable to use a study from 1998 that states 70% of cancer risk and heart disease is caused by diesel PM? Where is the more current study? Shouldn't the proposed regulation be based on a current study? (RRPI1)

Agency Response: We disagree. Staff utilized the most currently available data and research at the time the Staff Report was released. The health risk assessment conducted by staff for this proposed regulation is a valid characterization of the potential risks associated with exposures to diesel PM and NOx from in-use off-road diesel vehicles. The accuracy and validity of the diesel PM cancer risk factor based on epidemiological and toxicological data and

related findings and opinions of U.S. EPA and others are thoroughly discussed in the references cited in the Technical Support Document. No alternative data was presented to staff that changes this basis. A more detailed discussion on health risk associated with exposure to diesel PM can be found earlier in Chapter III-A-1 of the FSOR. The preponderance of scientific evidence clearly links diesel PM with increased cancer risks and as discussed in the Section 12d of the FSOR in the response to LEWISM2, ARB staff believes the current studies show even more risk from diesel PM.

In 1998, the Board identified diesel PM as a toxic air contaminant (TAC) and a needs assessment for diesel PM was conducted between 1998 and 2000. In 2000, the ARB adopted the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles (Diesel RRP). The scope of the Diesel RRP was broad, addressing all categories of engines, both mobile and stationary, and included control measures for private and public fleets of off-road diesel vehicles, such as those covered by the proposed regulation. The plan identified a strategy to regulate different categories of diesel emissions sources to achieve 75 percent reduction of diesel PM emissions by 2010 and 85 percent reduction by 2020 from the 2000 baseline.

As discussed in Chapter II of the Technical Support Document, California's Air Toxics Program, established under California law by AB 1807 (Stats. 1983, Ch. 1047) and set forth in HSC sections 39650 through 39675, mandates that ARB identify and control air toxics emissions in California. The identification phase of the Air Toxics Program requires the ARB, with participation of other state agencies, such as the Office of Environmental Health Hazard Assessment to evaluate the health impacts of, and exposure to, substances and to identify those substances that pose the greatest health threat as TACs. ARB's evaluation is then made available to the public and is formally reviewed by the Scientific Review Panel (SRP) established under HSC section 39670. Following the ARB's evaluation and the SRP's review, the Board may formally identify a TAC at a public hearing. The ARB identified particulate emissions from diesel-fueled engines (diesel PM) as a TAC in August 1998. Following the identification of a substance as a TAC, HSC §§ 39658, 39665, 39666, and 39667 require ARB, with the participation of the air pollution control and air quality management districts (districts), and in consultation with affected sources and interested parties, to prepare a report on the need and appropriate degree of regulation for that substance. The Board approved the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles in September 2000 (ARB, 2000). There are a number of regulations adopted through the Diesel RRP, which contain various strategies to reduce diesel emissions, in order to quickly address the health risk associated with diesel PM as soon as it had been established.

2. Technical Feasibility

1. **Comment:** Postpone any type of new regulation until such time as there is proven/affordable technology. (LOUKIANOFF) (STOWE2)
2. **Comment:** Even if the technology was available to bring older equipment up to these standards (which it is not!), there are not enough trained mechanics, or facilities, or even replacement equipment, if you could afford them, to meet the regulations. There will be a lack of supply to meet the demand for technology. An estimated 165,000 vehicles will have to be retrofitted, repowered, or replaced over the next 13 years to comply with the regulation, and manufacturers have indicated they are unlikely to have the supply to meet the demand. Manufacturers will have difficulty forecasting the demand because of the complexity of the regulation. (LITDEN) (DUVALL) (MARGETT) (AGCA3) (CAMARILLO5)
3. **Comment:** Given the available technology and what will be in the fleet in the future, the obvious conclusion is that CARB's regulatory approach will fail to achieve its goals in the early years while crippling the construction industry and causing massive layoffs. (EUCA1)
4. **Comment:** We don't even have proven technology with which to develop a plan. (STOWE1)
5. **Comment:** Requiring businesses to replace entire fleets with technology that does not yet exist is ridiculous. It doesn't make sense and it can't be achieved. (CAULFIELD)
6. **Comment:** New technology necessary for the regulation is not currently available. Currently there are very few options on the market for contractors like us to meet these requirements. (FOSTER) (FCICI2) (BES) (BECC)
7. **Comment:** Technology (i.e., Tier 4 engines) to meet the regulation's requirements will not be available until 2014. (ARTBA1) (PBL) (ECCO7)
8. **Comment:** The major issue with CARB's proposed regulations is that the technology that is necessary for off-road diesel equipment to be in compliance with the rules is not available at the price that most companies in the industry can afford. (ANDERSON1)
9. **Comment:** With respect to legacy equipment, Deere is concerned with the availability of engineered solutions necessary to bring thousands of fleets containing hundreds of different models of machines into compliance during the time frame allotted under the proposed in-use rule. (ECCO4)

10. Comment: The Board's proposed regulations are not viable from an economic or technological perspective. (MCCULLOUGH)
(PILCONIS)(AGCA3) (CEI2) (ACL)

11. Comment: It is uncertain what technology is or will be available to meet the regulation's requirements. (HCC) (NELSON2)

12. Comment: The regulation mandates unavailable technology.
(CEC)(CEC2)

13. Comment: The regulation will make people rely on unproven technologies, (CALCIMA)

Agency Response: As documented in Chapter VIII of the Staff Report and Chapter VIII of the Technical Support Document, staff believes the regulation is technically feasible and viable and is structured to only require technology after it has been proven.

The regulation will require fleets to pursue a mix of retrofits (also called verified diesel emission control strategies or VDECS), repower (engine replacements), accelerated turnover to cleaner, used vehicles, and accelerated turnover to new vehicles.

The regulation only requires retrofits if they are verified by ARB. ARB's verification procedure is discussed in Section B of Chapter VIII of the Technical Support Document. To be verified, ARB's verification procedure requires a retrofit manufacturer to demonstrate that their product is effective and durable, and any device that is verified must provide warranty protections to end users. Staff recognizes that not every vehicle subject to the regulation can be retrofit, and structured the regulation such that if a highest level VDECS is not available for a particular vehicle, or if one cannot be installed safely, then that vehicle is exempt from the retrofit requirements. As discussed in Section D of Chapter VIII of the Technical Support Document, there are a number of retrofits already verified for off-road use, including several new systems have recently been verified. Staff expects that the increased demand for retrofits in the off-road vehicle market brought about by this regulation will spur the verification of additional systems. In addition, the off-road showcase demonstration project is also expected to foster additional verifications of devices that not only achieve substantial diesel PM reductions, but also reductions in oxides of nitrogen as well. The technical feasibility of retrofits is discussed further in the responses in section III-A-2)a) of this FSOR.

As discussed in Section H of Chapter VIII of the Technical Support Document, and as Attachment 3 of the Third Notice of Public Availability of Modified Text and Availability of Additional Documents staff believes adequate numbers of engine repowers and new and used vehicles will be available to satisfy the

demand created by the regulation's requirements. The turnover requirements imposed by the regulation will require a maximum of 10 percent (eight percent in the initial years) of the statewide fleet's horsepower to turn over each year. The baseline natural rate of turnover of the statewide fleet is about 5 percent per year. Thus, the regulation will at most require 5 percent more turnover per year than normal. The regulation affects about 180,000 vehicles, so the maximum annual increase in demand for Tier 2 or better vehicles and engines in California will be at most an additional 5 percent, or about 9,000 per year. In reality, this number is high. Staff estimates that the average annual increase in turnover due to the regulation, from 2010 to 2020, is 2.5 percent. Increased turnover due to the regulation is discussed further in the response to comment III-B-4)a) of this FSOR. Staff believes this demand is likely to be satisfied through engine repowers, purchase of new vehicles, purchase of used vehicles, and/or installation of NOx retrofits.

The regulation also contains provisions so that fleets are not penalized if manufacturer delays prevent them from acquiring the equipment or vehicles they need. In the event there are delays in the introduction or availability of Tier 3 or Tier 4 vehicles, the regulation contains special provisions that allow the Executive Officer to grant extensions to the compliance requirements. These provisions mean that fleets will not be penalized if manufacturers experience delays in providing vehicles, engines, or retrofits,

The regulation also exempts specialty equipment for which repowers and used vehicle replacements are not available from the mandatory turnover requirements.

The regulation is structured around both the increasingly stringent new engine standards that have been in effect over the last six years, and future effective standards that will continue to take effect over the next four to six years. Tier 2 and Tier 3 vehicles are available today and fleets may comply by moving to Tier 2 or Tier 3 vehicles, by applying retrofits, and/or by retiring their dirtiest, oldest vehicles. In the Technical Support Document, staff acknowledged that Tier 4 engines will not be available for many horsepower groups until 2014. In recognition of this, staff structured the NOx fleet average targets accordingly. The availability of vehicles meeting the Tier 4 standards is addressed further below in this FSOR in response to comment III-A-2)c)i). The fact that fleets do not need to be 100 percent Tier 4 in order to comply with the regulation is discussed in Chapter 3 of this FSOR, in the response to comment III-A-3)a)i)2).

The affordability of the regulation and estimates of job loss are addressed in Chapter III-A-3 of this FSOR.

2)a) Retrofits

2a)i) Availability of Retrofits

- 1. Comment:** Retrofits are not available. (MBA)
- 2. Comment:** The retrofits necessary to comply with the regulation do not exist. (ECCO2)
- 3. Comment:** VDECS are not available for most equipment and there are safety issues with the installation of these devices. With the addition of the oxides of nitrogen (NOx) requirement, even fewer VDECS are available for retrofitting. (ECA)
- 4. Comment:** We will not be able to retrofit any of our equipment. I will go out of business because equipment cannot be retrofitted. There are not enough available technology, and the technology does not exist. (TURVEY)(DMCI)
- 5. Comment:** There is not enough retrofit equipment to meet the regulation, and there is little on the horizon. What there is very expensive and not proven. (AWD)
- 6. Comment:** Some machines cannot be retrofitted so they are just scrap. (CBC)
- 7. Comment:** There are very few approved aftermarket products for the removal of PM from diesel exhaust, and those that exist are extremely expensive. (FCICI2)
- 8. Comment:** Retrofit solutions are not currently available in an engineered, proven, warranted package. (SHAWM1)
- 9. Comment:** Available devices that reduce fuel consumption per mile, reduce emissions, and increase fuel economy should be included in the list of acceptable devices in this regulation. (SHC2)
- 10. Comment:** The regulation does not adequately address performance, reliability, installation and safety of VDECS equipment. We have obtained quotations for installation of VDECS units, and have also researched installations that have been performed on existing equipment by others. In all cases, the installations are not pre-designed and engineered but are performed on an as-you-go basis. Performance, reliability, installation and safety of VDECS equipment must be factored into the Rule. We are concerned that few VDECS on the market are not an engineered and thoroughly designed system (GC2)

11. Comment: VDECS are not available for most equipment and there are safety issues with the installation of these devices. Currently, available VDECS for off-road use are not proven, and installations are not properly engineered. The regulation would only compound the massive infrastructure issues that state is currently facing and delay vital public work projects funded by the infrastructure bonds passed by the voters last November. Must replace the prescribed 20% VDEC solutions, solutions that are not currently available in any engineered, proven, warranted package, regardless of what CARB staff wants to believe. (SHAWM1)

12. Comment: The "If we build it they will come" thinking is not practical. In other words if this law is passed the manufacturers will build the product to be compatible. Due to delays and changes to the proposed rule, i.e. adding NOx reductions late last year, manufactures and contractors will have a difficult time meeting the standards. Tier 4 engines will not be available until maybe 2015, and current VDECS are not readily available, too expensive and impractical to use on large construction equipment. (NBC)

13. Comment: There is a lack of available technology. The proposed regulations will have a devastating impact on construction, mining, and other affected industries and agencies. The cost of converting equipment, the lack of available technology, and the aggressive schedule for implementation would have severe and unmanageable economic impacts. These regulations will delay vital public works projects funded by the infrastructure bonds passed by voters last November. (OCBC)

14. Comment: There seems to be a disconnect in the technology in the ability to build the equipment that's necessary. If you install the retrofits, the warranty on the engine may not be good. (AGCA5)

15. Comment: I have to say when I first saw that on our machine when I walked into the Cat dealership, it reminded me of something of a movie, "Back to the Future." I can't believe that we're going to be forced to operate that on a daily basis in a rental atmosphere. (ECCO6)

16. Comment: Most products do not have replacement engines available to them and the VDEC technology is questionable at best. (JOHNSON)

17. Comment: We have letters from many contractors that have participated in CIAQC. We have no confidence at all in the VDECS technology that we're assured that's the way we can solve some of these issues So that's a great concern to us. (RMMC2)

18. Comment: Following the installation of this filter, many concerns arose relating to the safety and longevity of the product...As an equipment rental

company, it is extremely important that we supply our customers with equipment that is easy to regenerate and yet meets the emission requirements for their projects. Of the three “verified” solutions currently available for off-road, the HUSS filter is the only one that will work in the rental market, and quite frankly, I have real concerns about this particular device. The safety, installation, reliability, maintenance and costs associated with VDECS remain unproven and have not been properly researched to support real working solutions. CARB needs to do additional work in their verification process to assure all stakeholders under this regulation that they are getting what they are paying for – a product that works the way CARB says it will! (ECCO5)

19. Comment: Repowers will likely not occur. Thus, for the other 97% of the legacy machine models, the only options are to purchase new machines or, if feasible, install yet to be field proven after-treatment devices. As for these devices, in 2001 we participated in a joint CARB/South Coast/CIAQC program to test the feasibility of DPFs on this equipment. This program was ripe with problems of installation, safety and durability. In the last couple of weeks Quinn installed a costly dual-DPF on a large loader with similar safety concerns, and durability is yet to be determined. 6 years have passed and still many issues exist with safely retrofitting this after-treatment equipment. (QC)

20. Comment: There are only 3 VDECS verified by CARB. These VDECS have not been tested sufficiently enough on actual fleets to make most fleet owners comfortable with them and have many restrictions as far as which engine classes and years they can be installed on. Each fleet has to begin retrofitting 20% of its fleet a year- if a VDECS has an unexpected defect, 20% of a fleet's horsepower could potentially be affected in the first year of the regulation alone- most companies could not afford this type of setback. (TA)

Agency Response: ARB recognizes the need for more verified diesel emission control devices for off-road application. A number of technologies, are currently verified today and we expect that more will be verified soon. The regulation will provide a guaranteed demand for retrofits; manufacturers may have been waiting for the regulation to be passed before deciding whether to pursue verification, and we now expect that they will move forward. As shown in the Tables III-A-2(a)i)-1 and -2 below, there are currently six verified Level 2 and Level 3 diesel emission control systems for use in off-road vehicles.

Table III-A-2(a)i)-1 - Verified Level 2 DECS (as of April 6, 2007)

Product Name	Technology Type	PM Reduction	Applicability
Engine Control System AZ Purimuffler/Purifier	DOC + Alt Fuel	50%	1996-2002 off-road; PuriNOx

III-A-2)a)i)-2 - Verified Level 3 DECS (as of April 6, 2007)

Product Name	Technology Type	PM Reduction	Applicability
Cleaire Horizon	DPF	85%	Most on-road engines; 15 ppm sulfur diesel; CARB diesel, conditionally verified for off-road engines
HUSS Umwelttechnik FS_MK	DPF	85%	Most on-road and off-road diesel engines through 2007 model year.
Engine Control System Combifilter	DPF	85%	1996-2004 off-road; 15 ppm sulfur diesel; CARB diesel.
Caterpillar	DPF	85%	Conditionally verified for 1996-2008 model years; off-road, rubber tired; CARB diesel.
DCL International Inc.	DPF	85%	Conditionally verified for 1996-2008 model year, rubber tired off-road; CARB diesel.

Three of these systems DCL's MINE-X Sootfilter, Caterpillar DPF, and Cleaire Horizon - have been verified within the past year.

The regulation only requires retrofits if they are verified as proven, effective, durable and warrantied. In addition, the regulation never requires retrofits if they are not verified, will not work, or are not safe. Under the PM Requirements of the regulation, if a vehicle cannot be retrofit, it need not be turned over. This should satisfy the concern of the commenters who worried that retrofits would not be available to meet the regulation's requirements or that their vehicles would have to be scrapped because they could not be retrofit. ARB's verification procedure is discussed in Section B of Chapter VIII of the Technical Support Document. If a vehicle does not have a highest level VDEC or if one cannot be installed safely, the regulation exempts that vehicle from the retrofit requirements. Section 2449(c)(27) definition of highest level VDECS provides that if the diesel emission-control strategy manufacturer and authorized diesel emission-control strategy dealer do not agree a device can be used on a specific engine and vehicle combination without jeopardizing the original engine warranty in effect at the time of application, then the device is not considered warrantied. Also, section 2449(e)(8) provides that VDECS That Impairs Safe Operation of Vehicle or Conflicts with Other Requirement are not considered highest level VDECS and are not required to be used.

Potential devices that may reduce fuel consumption per mile, reduce emissions, and increase fuel economy may be included in the list of acceptable devices

once they are verified. The verification procedure ensures that emission reductions achieved by a control strategy are both real and durable and that production units in the field are achieving emission reductions which are consistent with their verification.

ARB expects the Showcase Program to yield many new verified products for off-road use. There are sixteen manufacturers with thirty products in the Showcase Program, and all have committed to pursue verification. The goal of the Showcase Program is to demonstrate the viability of diesel emission control devices in a variety of off-road environments as well as to obtain new emission control systems that will be ARB verified. This project provides an opportunity for manufacturers of diesel emission control technologies to participate with fleet owners in retrofitting their engines with a diesel emission control device to reduce diesel particulate matter or diesel PM plus oxides of nitrogen (NO_x) . Participation in the Showcase Program is open to private construction companies, public agencies, local governments, and other owners of off-road diesel construction equipment in the SCAQMD.

For further discussion on VDECS please refer to section III-A-2)a)iii).

Please see Chapter III-A-2)b) and III-A-2)c) of this FSOR for discussions of the availability of Tier 4 engines and vehicles.

Please see the response to comment III-A-2)a)xiii) of this FSOR for responses to concerns about poor VDECS installations.

Please see the response to comment III-A-2)a)ii) of this FSOR for a response to concerns about VDECS safety.

Please see Chapter III-A-3 of this FSOR for discussions of the affordability of the regulation, the economic impact of the regulation, the costs of retrofits, and the effect of the regulation on infrastructure projects, including those funded by the infrastructure bonds.

2)a)ii) Retrofit Safety

- 1. Comment:** One of the most significant objections to the required retrofit devices is that in many cases, the devices obstruct the operators' field of vision, negatively impacting the safety of the worksite. (GLATKY)
- 2. Comment:** VDECS are not available for most equipment and there are safety issues with the installation of these devices. (ECA)
- 3. Comment:** We are very concerned that visibility restrictions, fire hazards, trip hazards, and long-term structural issues have not been addressed. Forcing industry to install these units in this manner is creating a significant health and safety risk. (GC2)

- 4. Comment:** We have quotes on this PM device (the Huss DPF [diesel particulate filter]) and we have seen demonstrations of this device. We have serious concerns about the safety and of double and tripling these devices (i.e., installing more than one DPF canister) in order to make them function properly. (CAMARILLO1)
- 5. Comment:** The VDECS are not ready for broad application. This industry is made up of risk takers. But based on what we know about our real experience with those VDECS devices, we are not ready to take the risk on our equipment, our employees, or the financial well being of our firms. (CBCC3)
- 6. Comment:** We request that the following wording be added as the first sentence in section 2449(e)8: Under no conditions can a VDECS or any other control device required by this regulation be installed in any position that will in any way interfere with or obstruct the visibility of the operator of the equipment. (OE1)
- 7. Comment:** Following the installation of a Huss DPF on one of our vehicles, many concerns arose relating to the safety and longevity of the product. As an equipment rental company, it is extremely important that we supply our customers with equipment that regenerates easily and yet meets the emission requirements for their projects. Of the three “verified” solutions currently available for off-road, the Huss filter is the only one that will work in the rental market, and quite frankly, I have real concerns about this particular device. The safety, installation, reliability, maintenance and costs associated with VDECS remain unproven and have not been properly researched to support real working solutions. CARB needs to do additional work in their verification process to assure all stakeholders under this regulation that they are getting what they are paying for – a product that works the way CARB says it will. ECCO has first hand experience regarding the poor installation of a Huss VDECS that was installed by Huss representatives. CARB should carefully evaluate the application process to ensure the end-user receives a product which is safe, workable, and effective and backed with responsive customer service. (ECCO5)
- 8. Comment:** We do not have large pieces of equipment that can be repowered with the appropriate tier engines. The aftermarket devices that were presented at this seminar are expensive and the safety of these devices has me very concerned. The heat that is generated by these devices makes it very difficult to find a place to install them on our equipment that will be safe and productive. It appears that it will either restrict the operator's vision severely or it would have to be placed in an unsafe location on the equipment. (WPC1)

- 9. Comment:** In 2001, we participated in a joint CARB/South Coast/CIAQC program to test the feasibility of DPFs on equipment. This program was ripe with problems of installation, safety, and durability. Recently, Quinn installed a costly dual-DPF on a large loader with safety concerns and where durability is yet to be determined. Six years have passed and still many issues exist with safely retrofitting this after-treatment equipment. (QC)
- 10. Comment:** Installation left to the will-fit industry often violates machine and VDECS criteria. Installation problems have already been identified in the field resulting in failed VDECS, invalidation of Roll Over Protective Structure (ROPS) certifications due to mounting and excessive engine exhaust backpressures. (EUCA5)
- 11. Comment:** The current devices pose serious safety issues, including installation and visibility concerns. (CAMARILLO6)
- 12. Comment:** Retrofits are not safe. I am concerned about the VDECS retrofits. There are a couple of important things to note about the Huss unit - there are two filters on that machine. If the horsepower is over 500, there's going to be three. Therefore, I see a concern for fire, trip hazards, maintenance, and a lack of engineering. (GC4)
- 13. Comment:** VDECS are unsuitable for use on most off-road applications (even though ARB may have granted verification) due to space constraints, diminished visibility, machine vibrations, safety considerations and other maintenance issues. (AGCA3)
- 14. Comment:** We are very concerned about the installation of the PM devices especially on our crawler tractors and scrapers. Safety issues with the current PM devices include installation and visibility concerns. We need to extend the timeline to work out the serious safety issues posed from the placement of these devices on our tractors. (CAMARILLO5)
- 15. Comment:** Aftermarket retrofit devices are unsafe and impractical for our small equipment. (WPC2)
- 16. Comment:** The proposed use of VDECS may contribute to accidents and injuries. When we retrofit our vehicles, we will have to pay for the down time when these unproven technologies destroy engines due to the increased back-pressure on turbo-chargers. Installed VDECS will cause problems with OSHA, because no matter where they are mounted, they will impede the visibility of the operator. Most construction equipment is used around employees "on the ground" and 360 degree operator visibility

is critical. Restricting visibility will undoubtedly lead to increased accidents portending injuries and possible death of construction workers. This will result in wrongful death suits and fines from OSHA. Slow down the mandatory VDECS installation until the potential damage to existing engines can be determined and corrected and the restriction of visibility issue can be resolved. (DCCI)

17. Comment: The provision affording Compliance Flexibility for Delays in Availability of Tier 4 Vehicles (see Proposed Section 2449(e)(9)) should also allow the Executive Officer to provide a compliance extension in the event of GSE performance, reliability, or safety problems caused by retrofits. Simply because a retrofit or engine is nominally "available" does not mean that it will function in GSE without causing performance, reliability, or safety problems. GSE performance, reliability, or safety issues will impair the ability to move aircraft safely and efficiently through the gate and into the runway queue on schedule --causing delay or compressed take offs and landings. These effects ripple throughout the country, impairing the safe and efficient operation of both the airport in question and the National Airspace System. While the proposed Rule includes a provision that allows ARB to find that a particular VDECS is not the highest level "available" if it would impair the safe operation of the vehicle, that provision does not allow a compliance extension. See Proposed Section 2449(e)(8). Nor does the current proposed Rule address performance or reliability problems related to VDECS, safety issues at airports caused by use of VDECS that go beyond the safe operation of the vehicle itself, or any issues that arise after installation. (POHLE)

18. Comment: The off-ramp in the regulation related to safety is a very narrow off-ramp. It is certainly not enough to satisfy our concerns. (GC5)

19. Comment: We are concerned that we will lose safety in the name of health. Currently as proposed by the staff, your Executive Officer is the sole call if these installations are safe or not. We need safety professionals to be in charge of this, people who know the construction industry, who know the OSHA rules and regulation, who know what it does take to be safe. The two filters that we saw today are unsafe in my professional opinion. They will cause more deaths in the construction industry, fire in the equipment, and burns to the operators. Currently we have between 500 and 600 fatalities every year in this industry from struck-by accidents. We will have more struck-by fatalities with this equipment. (OE4)

Agency Response: The comments above are based on a limited number of technologies that were verified at the time of the Board hearing. Based on recent activity, we expect that more will be verified in the near future. The regulation

provides a market demand for retrofits. We believe some engine or retrofit manufacturers may be waiting for the regulation to become final before deciding whether to invest the time and resources necessary to obtain verification, and we now expect that they will move forward.

Several commenters have raised concerns that VDECS are not safe because they are untested or unproven. To the contrary, VDECS have been tested and proven in many off-road applications around the world, with many being originally developed and first installed for use in underground mining applications. Chapter VIII of the Technical Support Document describes several construction and other off-road vehicle and equipment retrofit projects that were completed before adoption of the regulation. For a fuller explanation about how the regulation relies only on technology that is proven, see the responses regarding technical feasibility of retrofits, repowers, and new vehicles in Chapter III-A-2 of this FSOR.

In addition, ARB, the South Coast Air District, and the Mobile Source Air Pollution Reduction Review Committee are also currently in the midst of the \$5 million off-road retrofit Off-Road Showcase program (Showcase). ARB expects the Showcase to yield many new verified products for off-road use. There are sixteen manufacturers with thirty products in the Showcase, and as a condition of participating, they all have committed to pursue verification. More detailed information regarding the availability of retrofits is discussed in the response in section III-A-2(a) and III-A-2(a)i) in Chapter III-A-2 of this FSOR.

As part of the ARB verification process, the VDECS manufacturer must provide a complete discussion of possible safety issues resulting from the installation of the VDECS on an engine, and must provide a third-party letter from the operator discussing the performance of the device in operation. Additionally, the device must undergo a minimum of 1000 hours of durability testing in the field, and the VDECS manufacturer must provide a warranty for the VDECS. The warranty requirements for off-road VDECS are summarized in Table VIII-1 of the Technical Support Document. See also the response in section III-A-2(a)ii) in Chapter III-A-2 of this FSOR regarding the verification procedure and how it ensures that VDECS are adequately tested.

Under the process in section 2449(e)(8), a VDECS that impairs the safe operation of the vehicle would not be considered a highest level VDECS. If all VDECS for a given vehicle or application would impair the safe operation of the vehicle, then the vehicle is considered to have no highest level VDECS, and no VDECS must be installed. Also, the regulation gives fleet owners a choice as to which vehicles they retrofit first, so if retrofit installations are more challenging on some vehicles, fleet owners may choose to retrofit others first.

We recognize that some VDECS installations may pose safety hazards. In particular, if installed inappropriately, a VDECS may obstruct operator visibility and may pose heat hazards. It is not the intent of the regulation to endanger

anyone by requiring unsafe installations of VDECS, and section 2449(e)(8) of the regulation provides a process under which the Executive Officer would determine that a VDECS cannot be installed safely, in which case its use is not required. We believe the safety provisions in the verification procedure and regulation are adequate to ensure that the regulation will not require any unsafe installations.

The regulation also contains an appeals procedure so that if a fleet owner disagrees with the Executive Officer's decision regarding the safety of a device, the fleet owner has the opportunity to challenge an Executive Officer's determination that a VDECS does not impair the safe operation of a vehicle. The procedure for determining whether a VDECS is safe is discussed further in the response in section III-A-2)a)ii)1) in Chapter III-A-2 of this FSOR.

Commenter CAMARILLO1 raised a concern regarding installations that require multiple canisters. Under the regulation's definition of Highest Level VDECS, a device is only considered verified if the device manufacturer and dealer agree it can be installed and function properly without voiding the engine's warranty. A device will likely not be considered a highest level VDECS available if it would require too many canisters to operate properly or fit within the allowable space. For example, Huss engineers and installation technicians recently came to the conclusion that it is not currently feasible to install the Huss diesel particulate filter (DPF) devices on six Caterpillar machines, because of safety and space issues in the Carl Moyer Memorial Air Quality Standards Attainment Program.

Several commenters raised concerns regarding retrofit durability and maintenance. As discussed in Chapter IX of the Technical Support Document, retrofit devices must be maintained and periodically cleaned. A discussion of how costs associated with VDECS maintenance were built into the cost analysis done to support the rulemaking is included in the response in section III-A-3)d)i)3) in III-A-3 of this FSOR.

Commenter ECCO5 expressed concern regarding the customer service of VDECS suppliers. While the regulation does not mandate that retrofit manufacturers and installers provide responsive customer service, manufacturers and dealers should have a strong interest in providing satisfactory or superior service to build a loyal customer base. As more retrofits become available, the market will become more competitive, and firms that do not provide adequate customer service will be at a disadvantage. Under all circumstances, retrofit manufacturers and installers are bound by the warranty provisions of the Verification Procedure.

Several commenters raised concerns that the regulation would violate Cal OSHA requirements and suggested that ARB staff work with Cal OSHA. During development of the regulation, ARB staff met with Cal OSHA staff to discuss Cal OSHA safety regulations and how they pertain to VDECS installation. ARB is not aware of any existing conflicts between this regulation and Cal OSHA

requirements. Indeed, ARB modified section 2449(e)(8) to specifically address the issue of conflict with Cal OSHA or other state and federal safety regulations. Specifically, section 2449(e)(8) was modified to state that ARB would not consider a VDECS to be a highest level VDECS available if the use of the VDECS made compliance with the safety laws impossible. We anticipate continuing to meet with Cal OSHA staff regarding safety issues during the implementation of the regulation.

The comments above also raise or allude to other issues that are discussed in other responses. Please see the response in section III-A-2)a)xiii) in Chapter III-A-2 of this FSOR regarding poor installation of retrofits. Please see the response in section III-A-2)a)xviii) in Chapter III-A-2 of this FSOR for a response to the concern that VDECS could generate excessive backpressure or damage engines. Please see the response in section III-A-2)a)xx) in Chapter III-A-2 of this FSOR for a response to suitability of VDECS for use with GSE. Please see also the response in section III-A-2)a)i) in Chapter III-A-2 of this FSOR regarding availability of retrofits. Please see also the response in section III-A-2)b) of Chapter III-A-2 of this FSOR regarding the feasibility of repowers. A more detailed discussion of the verification procedure, relative to safety issues, is addressed in the response to comment III-B-2a)ii)1) of this FSOR. Finally, see the response in section III-A-2)a)iv) in Chapter III-A-2 of this FSOR for a discussion of the technical suitability of VDECS for construction applications

2)a)ii)1) Safety Procedure for Retrofits

- 1. Comment:** We believe that the safety issue has been seriously overlooked. There has not been enough thought given in the direction of where the units should be installed, especially as regards poor visibility and the protection of the operators from a fire. Where these units are installed can put not only the operator in jeopardy, but anyone on the ground working near them. (CAMARILLO3)
- 2. Comment:** The proposed use of VDECS may contribute to accidents and injuries. When we retrofit our vehicles, we will have to pay for the down time when these unproven technologies destroy engines due to the increased back-pressure on turbo-chargers. Installed VDECS will cause problems with OSHA, because no matter where they are mounted, they will impede the visibility of the operator. Most construction equipment is used around employees "on the ground" and 360 degree operator visibility is critical. Restricting visibility will undoubtedly lead to increased accidents portending injuries and possible death of construction workers. This will result in wrongful death suits and fines from the Occupational Safety and Health Administration (OSHA). Slow down the mandatory VDECS installation until the potential damage to existing engines can be determined and corrected and the restriction of visibility issue can be resolved. (DCCI)

3. Comment: We recommend that ARB staff contact the California OSHA (Cal OSHA). Cal OSHA has been very effective with their advisory committee process. You've seen various regulations move through that process. And with those regulations, you've seen a significant amount of consensus between all the various stakeholders, be that labor, management and staff of the various regulatory agencies as well as those in the environmental community. So we would definitely challenge this body to contact those folks and maybe employ some of their best practices, and maybe that will help incite or create some consensus in the process. (CALPASC4)

Agency Response: Staff agrees that provisions in the regulation are necessary to ensure that the retrofit requirements do not impair the safe operation of a vehicle due to installation of a VDECS. In order to ensure that there is a comprehensive process to address this, the regulation contains provisions such that (section 2449(e)(8)):

If a VDECS manufacturer or authorized diesel emission-control strategy dealer states that there is no safe or appropriate method of mounting its VDECS on a vehicle, then the VDECS will not be considered verified for that vehicle, and the Executive Officer (EO) may find that a VDECS should not be considered the highest level VDECS available because it cannot be safely installed or operated in a particular vehicle application, or its use would make compliance with occupational safety and health requirements, mining safety and health requirements, or an ongoing local air district permit condition, such as for use of a diesel oxidation catalyst, impossible. Upon the review of the above or other documentation submitted in the absence of a declaration from the VDECS manufacturer, the EO will inform the requesting party, in writing, of his or her determination, within 60 days of the receipt of the request. An appeals procedure that provides a fleet owner the opportunity to challenge an EO's determination that a VDECS does not impair the safe operation of a vehicle (section 2449(e)(8)(A) and (B)) has also been added to the regulation.

Commenter CALPASC4 suggested that ARB staff contact CalOSHA staff. During the course of regulation development, ARB staff did contact and meet with CalOSHA staff to make CalOSHA aware of ARB's proposal, and to obtain CalOSHA's input on the safety exemption in the regulation. During the course of regulation implementation, staff plans to coordinate further with CalOSHA staff and to develop guidelines that provide more detail regarding the procedure for determining whether a VDECS can be installed and operated safely.

How staff accounted for the cost due to retrofit installation is discussed in the response to comment III-A-3)d)ix) of this FSOR.

The issue of reaching consensus with stakeholders affected by the regulation is addressed in the response to comment III-A-16)g) of this FSOR.

A more detailed discussion of the verification procedure, relative to safety issues, is addressed in the response to comment III-B-2)a)ii)1) of this FSOR.

2)a)ii)2) Retrofit Removal Provision

- Comment:** ARB should grant the Executive Officer the authority to authorize removal of VDECS from equipment already retrofit pursuant to the rule, should the Executive Officer become aware of safety issues with the VDECS in question. The authority could be exercised should the Executive Officer become aware of multiple failures of the VDECS in specific or broad applications which are resulting in injury, death, or significant damage to equipment or production capacity. This is necessary due to the untested nature of the VDECS. (CALCIMA)

Agency Response: The regulation already gives the Executive Officer sufficient authority to allow the removal of a VDECS that is found to be unsafe after installation. For example, the Executive Officer may revise or revoke the verification status of a device. Under the Verification Procedure, the Executive Officer has authority under §2709(i) to require a manufacturer to conduct in-use testing or additional in-use testing if there are excessive warranty claims. If the manufacturer fails to demonstrate compliance, the verification can be amended, suspended or revoked (§ 2709(l)). To the extent that safety considerations were improperly or falsely presented during the application or verification process, the Executive Officer may also take action to revoke a verification. (See 2702 and 2703).

In addition, if during regulation implementation, members of the public bring safety concerns to the attention of the Executive Officer, the Executive Officer may revise the finding per section 2449(e)(8) that the VDECS can be used without impairing the safe operation of a vehicle.

See also the response in section III-A-2)a)ii) in Chapter III-A-2 of this FSOR regarding the verification procedure and how it ensures that VDECS are adequately tested.

2)a)ii)3) Safety Review by Safety Professional

- Comment:** In the interest of workplace safety, it is recommended that the regulation call for a retrofit installation design plan review by an independent and certified safety professional prior to, and as a condition of, purchase. (LACITY)

Agency Response: The complexity and cost of the regulation would increase if the regulation called for a retrofit installation design plan review by an independent and certified safety professional prior to, and as a condition of, purchase. A plan for the safe design and installation of a retrofit should in fact be

the practice of the retrofit installer and manufacturer. However, fleet owners are welcome to initiate these reviews themselves and if they do, ARB encourages them to share any pertinent information obtained with ARB staff.

2)a)iii) Verification Procedure for VDECS

2)a)iii)1) Verification Too Long or Complicated

- 1. Comments:** The certification process of VDECS will need to be expedited. (ECA)
- 2. Comments:** We urge ARB to reduce compliance costs by working harder to streamline and revise its emission equipment verification process. ARB programs should be more similar to programs in Europe. My understanding is that they approve devices for large categories of engine ranges, and that is attractive to us. ARB is a lot more careful and particular about how it approves the devices we're talking about. (CAPCOA)
(CAPCOA2)
- 3. Comments:** MECA strongly believes that ARB's retrofit verification program must also be resourced and streamlined. The current process is slow and resource intensive, and the current staffing level is inadequate. Additional qualified resources with a working knowledge and the latest NOx control technologies, such as SCR, are necessary in order to handle the diversity of the applications and the complexity of technologies that are being developed to achieve both PM and NOx reductions. (MECA2)
- 4. Comments:** These devices that we can use in New York, we cannot use them in California. They're not verified by CARB. And we're in a situation where we're dependent on CARB approving a regulation to create a market to attract vendors to the marketplace and go through the verification process. And that takes time. (GC5)
- 5. Comments:** The other problem, which Granite brought up, is the availability of VDECS that you can use in Europe. They are approved in Europe. They are approved in New York. They are approved by Federal EPA. We can't use them here. So that does limit the available pool that we have and then because of these costs differences and the greater impact on the cleaner fleet from a cost standpoint, we start with equipment that has a higher depreciation on it, and so, our costs just start out higher.
(TA2)
- 6. Comment:** We recognize that VDECS are used widely in Switzerland and New York City today, and request that CARB allow California fleets to use federally and internationally tested and accepted VDECS on their own fleets. This would increase availability of VDECS for California fleet

owners both in quantity and range of engine classes and would bring prices of VDECS down. (TA)

7. **Comment:** The application and pre-application processes are redundant and totally unnecessary. There are products that are performing well in Europe, Asia, and Australia but cannot penetrate the American market because of the arrogance of the ARB. Many of our problems with air quality could be solved if the ARB would revise its verification process. I feel that the ARB takes a negative attitude towards any product not manufactured in the U.S. This attitude needs to be adjusted to allow the public more choices in devising their emission control strategies. (LESTER)
8. **Comments:** The safety, installation, reliability, maintenance and costs associated with VDECS remain unproven and have not been properly researched to support real working solutions. CARB needs to do additional work in their verification process to assure all stakeholders under this regulation that they are getting what they are paying for- a product that works the way CARB says it will. ECCO has first hand experience regarding the poor installation of a HUSS VDECS which was installed by HUSS representatives. CARB should carefully evaluate the application process to insure the end-user receives a product which is safe, workable, and effective and backed with responsive customer service. (ECCO5)
9. Comment: Technical lab performance and durability testing of the VDECS by ARB in itself is not adequate testing to approve its use on actual operating equipment. (EUCAS)

Agency Response: We believe that ARB's verification process strikes the right balance between expediency and ensuring that the verified device will perform as designed in a reliable, safe, and durable manner. We do not believe there are any superfluous steps that could be eliminated and still allow a thorough evaluation of a device. In addition, the verification process, in conjunction with the required warranty should provide the fleet owner with confidence that a verified device will perform as advertised, or in the rare instance that a verified diesel emission control strategy (VDECS) malfunctions, that they have recourse through the warranty.

ARB's program has been designed to allow a broad variety of diesel emission control strategies and technologies to be verified. Those strategies include, but are not limited to, diesel particulate filters, selective catalytic reduction (SCR) converters, alternative diesel fuels, fuel additives and combinations of the above. With this in mind, California has developed a suite of regulations that require, among other things, the installation of retrofits on in-use vehicles and engines, of which this regulation is one. However, at the core of these regulations are

requirements that fleets utilize devices that achieve a certain level of performance (typically BACT), not a particular technology.

Although ARB, U.S. EPA, and Europe (commonly referred to as VERT) all have verification programs intended to verify the emission reduction performance of diesel emission control technologies, there are important differences in terms of the scope and testing requirements between these programs. Devices verified by U.S. EPA and allowed in other states are not subject to the same level of testing and evaluation as those verified in California, including not evaluating potential increases in emissions of nitrogen dioxide (NO₂), nor providing end-user warranty protections. The VERT program focuses on diesel particulate filters (DPF), sometimes used in combination with fuel additives, and currently does not verify NO_x reductions. Also, VERT measures the filtration efficiency of filters in terms of particulate number (greater than 10 nanometers) and elemental carbon reduction, while the ARB measures the filtration efficiency of filters in terms of percent reduction in mass. In addition, the VERT testing methodology cannot accurately determine NO₂.

These important differences illustrate why the regulation requires the use of ARB verified devices, as opposed to allowing the use of a retrofit that has been verified by any other governmental agency (i.e., U.S. EPA or VERT). Both the VERT and U.S. EPA programs include systems which cannot comply with ARB's strict, health protective, NO₂ requirements. For example, of the five U.S. EPA verified systems that correspond to a Level 3 ARB verification, only four have been verified by ARB, and of these devices several have subsequently been deverified as they were found to generate NO₂ beyond what was determined to be an acceptable risk level.

Also, VERT allows that verified DPFs may be used on all engine families irrespective of whether they are used on on-road, off-road, or stationary applications. ARB, on the other hand, verifies a diesel emission control strategy based on defined engine families, with limited scope of application and operating conditions. We believe this greater specificity is necessary to ensure reliable and effective operation of the VDECS in a particular application on a known group of engines. ARB believes that this is the more appropriate policy given that ARB requires owners of vehicles to install VDECS, and the requirement effectively lessens the burdens imposed on vehicle owners..

At its core, ARB's verification program is intended to evaluate and assure the emission and durability performance of any diesel retrofit system. Durability testing includes actual field tests on operating equipment, including demonstrations to ensure that the device:

- does not cause damage to the engine or engine malfunction,
- does not hinder or detract from the vehicle's or equipment's ability to perform its normal functions, and

- is be physically intact and well mounted with no signs of leakage or other visibly detectable problems.

To ensure the long-term performance of a verified system, after VDECS have been through the verification process, ARB still requires field testing on actual operating equipment and in-use compliance testing data. If problems surface after the verification process, then an ARB VDECS can be deverified. While U.S. EPA has similar in-use testing requirements, the VERT program does not.

Also, as part of the ARB program, a VDECS manufacturer must provide a warranty with the VDECS that will cover the full repair or replacement costs, should the VDECS cause damage to the engine during the warranty period. The VDECS manufacturer must submit to the ARB an annual warranty report and based on that information, the verification of the VDECS may be revoked should it be deemed necessary.

To support ARB's verification program, ARB employs staff qualified to evaluate the devices throughout the verification process, and in fact has recently increased the number staff working in the verification program. ARB continually looks to make the verification process as efficient and expeditious as possible and will continue in the future to work to make it as streamlined as possible, without compromising the overall robustness and thoroughness of the program.

We disagree with commenter LESTER that ARB is biased against devices manufactured outside the United States. In fact, ARB has actively reached out to all the companies verified through VERT to invite them to apply for verification for their products in California. During development of the off-road regulation, ARB mailed a letter to each of the firms with VERT verification, informing them of the upcoming off-road regulation, and inviting them to pursue verification in California and market their products in California. Finally, ARB has issued verification to several firms based outside the United States, including HUSS of Germany and DCL of Canada.

Please see also the responses in section III-A-3)d)ix) of this FSOR for a discussion of the costs of VDECS.

2)a)iii)2) Installation Ability Not Included in Verification

- Comment:** The process for determining exemptions for VDECS needs to be more clearly defined. These devices will be unsuitable for most existing applications. Even though they may be certified for certain applications, they may not be suitable for installation due to space constraints, diminished visibility, safety considerations or considerations from other agencies such as OSHA and OEHHA. (CIAQC7)
- Comment:** The proposed Rule presumes that any Level 2 or 3 VDECS that has been verified by ARB for a particular engine is “available” and can

be installed on a vehicle by the end-user. See, e.g., Proposed ORD Rule, § 2449(c)(22). However, ARB verification of a diesel particulate filter (DPF) or other retrofit device means only that the device itself can eliminate the specified emissions and can continue to do so during its warranty period -- it does not confirm that the device can readily be installed on a given vehicle. Nor does ARB verification address the considerations, requisite for promulgation of the ORD Rule, of technical feasibility, extent of vehicle redesign, necessary lead-time, cost, or other issues involved in seeking to integrate the retrofit into a particular piece of equipment. (POHLE)

Agency Responses: The selection of an appropriate retrofit for a particular application is a multi-step process. First, a fleet owner must determine which VDECS are verified for a given engine, and then the owner, typically in consultation with a retrofit installer or manufacturer, must ensure that the VDECS is appropriate and feasible for the given application.

The commenter is correct to note that the verification process itself does not address the feasibility of installation (for such things as visibility impacts, space constraints, etc), extent of necessary vehicle redesign, necessary lead-time, cost, and other issues involved in determining the feasibility and appropriateness of a specific retrofit installation; to do so would be inappropriate. As a matter of practice, it would be impractical to attempt to verify installation details for each retrofit on every possible vehicle type, considering that there are hundreds of off-road vehicle types, from dozens of manufacturers. If ARB required that retrofit installation details be verified ahead of time for every possible engine and vehicle combination, verification would become prohibitively expensive and cumbersome for applicants, and it would be impossible for ARB to issue verifications in a timely manner. It is important to note, however, that as part of the verification process, ARB encourages verification applicants to supply data for the most challenging application possible, so as to be able to issue as broad a verification as possible.

The appropriateness of a VDECS installation should be evaluated in conjunction with the VDECS installer or manufacturer. As discussed further in the responses in section III-A-2)a)ii) of this FSOR, if a fleet owner believes that a retrofit that is verified for a vehicle in his fleet would not be safe to operate, he may apply to ARB with supporting documentation. ARB's Executive Officer may determine that the VDECS would not be appropriate for a certain vehicle or vehicle application because it impairs the safe operation of the vehicle. For example, in some cases VDECS may impair driver visibility, may not be able to be safely mounted without damaging the structural integrity of the vehicle, or may cause other safety concerns. In such cases, the VDECS in question would not be required, even though it might be verified for the particular engine in question. However, in performing an initial assessment of the appropriateness of a VDECS installation, the fleet owner is expected to incorporate the necessary lead-time to install a

retrofit device on its vehicle as part of their normal planning for future fleet modifications.

Please see also the responses in section III-A-3)d)ix) of this FSOR for a discussion of the costs of VDECS.

2)a)iii)3) Ski Industry Equipment Not Included in Verification

- 1. Comment:** Most of our resorts are above 7,000 feet. Some of them are at an altitude of over 10,000 feet. And a lot of the way that things are calculated, it's really done at under 5,000 feet. So we have a really unusual business and kind of want some consideration there. (BIGBEAR)
- 2. Comment:** Retrofit controls as currently drafted are not feasible. Our technical consultants have explained to the ARB staff that the feasibility of Level 3 VDECS is questionable. The ski industry fleets operate at elevations (7,000+feet vs. 5,000 feet) greater than that certified by engine manufacturers and VDECS manufacturers. Moreover, no such controls have been installed in Europe or in the United States that we are aware of. VDECS retrofits on snowcats have been unsuccessful when attempted by original equipment manufacturers in Switzerland and Italy on Tier 2 engines. This is of grave concern to us. (CSIA)
- 3. Comment:** What we'd like to see is some kind of breathing room in the next two to three years for us a sit down and work with the VDECS manufacturers. Now, I'm sure there will be a lot of them saying they can do it. We've heard this about our ski industry for a lot of years and a lot of different products, be they either electronics or what have you, and seldom do they work well. We don't want to find ourselves in the position of buying this equipment, putting it on in the summer, and finding out when we're doing our normal operations or our search and rescue or our avalanche that the stuff doesn't work. We are concerned about that dimension of it. (CSIA2)

Agency Response: We believe that the regulation already addresses the commenter's concern. Under the regulation, fleet owners are not required to install a VDECS if VDECS manufacturers conclude that retrofit devices cannot be installed in a particular application. In requiring the application of BACT, the regulation requires the installation of the highest level VDECS, where the definition of highest level VDECS is "...the highest level VDECSfor a specific engine as of 10 months prior to the compliance date, which(1) can be used without impairing the safe operation of the vehicle as demonstrated per section 2449(e)(8), and (2) the diesel emission-control strategy manufacturer and authorized diesel emission-control strategy dealer agree can be used on a specific engine and vehicle combination without jeopardizing the original engine warranty in effect at the time of application." As such, if the device manufacturer and installer conclude that a VDECS cannot be safely installed on a piece of

equipment that will operate at elevations in excess of 7,000 feet (as per the commenter), then the regulation would not require that vehicle to be retrofit.

However, in response to the concerns raised by the ski industry in this regard, ARB is currently working jointly with 3 different California ski resorts on a retrofit evaluation project, which is collecting operational data on 12 snowcats operating at high altitude. These ski resorts include Mammoth, Northstar, and Sugar Bowl. Thus far, the project has not indicated an inability of vehicles that operate at high altitude to be retrofit with a diesel particulate filter. In fact, preliminary findings from the study, which has recorded exhaust temperatures for the 12 snowcats, indicate that the duty-cycle and exhaust temperatures from the snow cats are adequate to support regeneration of passive diesel particulate filters. Future efforts in this study may include the installation of DPFs to evaluate whether there are any operational issues with their installation.

2)a)iii)4) Validate Effectiveness of Retrofits

- 1. Comment:** The regulation should include initial measures that include a retrofit exhaust system (such as a catalyst) and perhaps some form of adjustment with a measurement to validate improvements if these solutions offer some benefit. Unless the effectiveness of the regulation can be validated, it can not be adopted without being considered arbitrary. (DORAZIO2)

Agency Response: While the regulation requires the installation of retrofits to reduce emissions, it only requires the installation of retrofits that have been verified as effective and durable through the ARB's Verification program. A thorough discussion of ARB's Verification procedure is provided in Chapters VIII of the Staff Report and TSD.

The regulation also requires fleets to accelerate turnover to cleaner, higher tiered engines and vehicles. We are assured that higher tier engines and vehicles will have lower emissions than the lower tier engines and vehicles they replace because of the testing done by engine manufacturers to certify their engines.

Overall, we are confident the regulation will be effective in reducing emissions. As discussed further in Chapter III-A-11 of this FSOR, the regulation incorporates many safeguards such as annual reporting, which when accompanied with periodic inspections and spot checks, will allow ARB staff to ensure fleets are taking the actions required and that the projected reductions in emissions are being realized.

2)a)iii)5) VDECS Testing Inadequate

- 1. Comment:** Technical lab performance and durability testing of the VDECS by ARB itself is not adequate testing to approve its use on actual operating equipment. (EUCA5)

Agency Response: While it is unclear as to whether the commenter believes ARB performs the durability and performance testing in support of its verification program, we would like to clarify that ARB does not perform such testing. All testing done in support of verification is performed by the device manufacturer, per the requirements of the Verification procedure (sections 2700-2710, Title 13, CCR), and submitted to ARB for review and approval. The durability testing must include a minimum amount of actual field testing on operating equipment.

During the field test on actual operating equipment, the DECS must:
not cause damage to the engine, or cause the engine to malfunction,
not cause backpressure outside of the engine manufacturer's specified limits or which results in any damage to the engine,
not hinder or detract from the vehicle equipment's ability to perform its normal functions, and
be physically intact and well mounted with no signs of leakage or other visibly detectable problems.

After a VDECS has been through the verification process ARB still requires in-use compliance testing data to demonstrate the continued effectiveness and durability of the VDECS in actual service. If problems arise after the initial verification process is complete, then a VDECS can be deverified.

Also, the VDECS manufacturer must provide a warranty with the VDECS that will cover the full repair or replacement costs, should the VDECS be defective, or cause damage to the engine or vehicle. The VDECS manufacturer must submit to the ARB an annual warranty report and based on that information, the verification of the VDECS may be revoked should it be deemed necessary.

2)a)iv) Retrofits Unproven

1. **Comment:** The regulation relies too heavily on unproven retrofit technology. Under what field conditions will the retrofit equipment work as promised to reduce emissions and what impact will it have on performance and productivity of the off-road vehicles? Aggressive implementation dates are based on the development and manufacturing of technology that does not exist and is unproven. (GC1)
2. **Comment:** We also have serious problems with the warranty of the Huss device. In the warranty it states that you have to present the device to a dealer when there is a problem. If the device can be repaired it will be returned to you within 30 days. If the unit has to be replaced the time frame extends to 90 days or when a replacement unit becomes available. These units are extremely expensive and there is not one contractor that can afford to have his machine sit for up to 90 days. (CAMARILLO1)

3. **Comment:** There is uncertainty regarding the reliability of retrofits in off-road applications. Moreover, uncertainty persists regarding this reliability of diesel emissions control devices on off-road engines (which can vary greatly in shape, size, and duty cycle, and which may be tasked to operate under difficult conditions in austere environments). (USN)
4. **Comment:** Recent installations have made it clear that the VDECS manufacturers are not prepared and have not done the necessary engineering to install these devices on California's off-road fleet. They are not properly engineered. VDECS are not ready for broad application. The clamps, restraints and hoses are not durable enough to withstand the heat and vibration of heavy use. (CIAQC7)
5. **Comment:** We object to the required retrofit devices because the size and weight of the required devices and machine vibration may lead to premature device failure. (GLATKY)
6. **Comment:** The verified retrofit products also leave us convinced of the need for more time for CARB to conduct further investigation. Does anyone expect this equipment to survive the rigors of construction applications? (ECCO2)
7. **Comment:** Excessive failure rates were documented with early installations in Switzerland. This will happen under the ARB ruling also. Failures will erase emissions gains, impact production and profitability, resulting in additional costs to the equipment owner. (EUCA5)
8. **Comment:** The regulation requires particle levels that are not practical in the construction industry. A lot of the gains in diesel technology have really been obtained in over-the-road trucks that work in a totally different environment than ours. The longevity and reliability of our engines and our off-road environment where they beat and bash around over rough terrain day in and day out in all extremes of weather, dust, dirt, and a variety of instances, it is much harder to obtain than it is in a controlled environment on the highway. (MCCLAUGHLIN)

Agency Response: The regulation only requires retrofits if they are verified under ARB's verification procedure and can be safely installed. ARB's verification procedure is discussed in Section B of Chapter VIII of the Technical Support Document. If a vehicle does not have a highest level VDECS or if one cannot be safely installed, the regulation, in section 2449(e)(8), exempts that vehicle from the retrofit requirements.

The issue of vibration affecting the physical integrity of a device is addressed in the verification process. Before submitting a formal application for the verification of a diesel emission control strategy for use with an emission control group, ARB

requires all device manufacturers/applicants to submit a proposed verification testing protocol (pursuant to section 2702(b)) at the Executive Officer's discretion. To obtain verification, the applicant must conduct emission reduction testing (pursuant to Section 2703), durability testing (pursuant to Section 2704), a field demonstration (pursuant to Section 2705), and submit the results along with comments and other information (pursuant to Sections 2706 and 2707) in an application to the Executive Officer. Durability is more fully defined in section 1900(b), Title 13 CCR 13, where "Durability means the ability of the applicant's diesel emission control strategy to maintain a level of emissions below the baseline and maintain its physical integrity over some period of time or distance determined by the Executive Officer pursuant to these regulations. The minimum durability testing periods contained herein are not necessarily meant to represent the entire useful life of the diesel emission control strategy in actual service. Physical integrity means that the device must maintain its physical structure, and all of its components not specified for regular replacement during the durability demonstration period must remain intact and fully functional."

In several current verifications, ARB has limited the verification only to applications with less vibration because the device manufacturer did not demonstrate the device would be durable under high vibration applications. For example, in ARB's verification of the Caterpillar DPF and DCL International Inc., we limited the verification to rubber tired vehicles because data demonstrating that the devices would be appropriate for higher vibration applications, such as on tracked vehicles, was not presented.

In addition, the warranty obligations of the installer under the verification procedure provide that any defects in installation are the responsibility of the installer to remedy. This would include such failures as clamps, restraints and hoses which are not durable enough to withstand the heat and vibration of heavy use identified, as noted by commenter CIAQC7

Staff does not believe that the regulation will force individuals to have vehicles out of service for 90 days in the case of VDECS failure, as commenter CAMARILLO1 states. Staff expects that, in order to reduce equipment downtime for maintenance, filter cleaning and other reasons, many fleets will maintain extra (spare) retrofit components that can be used, among other reasons, in the event of a VDECS failure. Staff also expects that, as part of their servicing of these equipment, retrofit dealers, installers, and manufacturers will also have spare components available for such occurrences. Because of this, staff does not expect that excessive downtime as a result of a VDECS failure will occur.;

As commenter EUCA5 points out, initially, there were failures of retrofit devices in Switzerland during their initial installation period. The failure rate started out about 10 percent and dropped to well below 1 percent as the program progressed. While there may be some failures of VDECS in California as well when the regulation is first implemented, we believe the rigor of the ARB

verification program, coupled with the experiences that have been gained since the implementation of the Swiss program (into which many ARB verified retrofit manufacturers sell their products) will result in significantly fewer failures than occurred in Switzerland.

2)a)v) Wait for Original Equipment Manufacturer VDECS

1. **Comment:** We would feel much more confident in the diesel particulate filters if they were being offered by the major manufacturers that originally supplied the equipment. (GC1)
2. **Comment:** From customer interviews, we have determined that an Original Equipment Manufacturer (OEM) complete solution is the desired solution to the retrofit challenge. This is for a number of reasons:
 - Installation left to the will-fit industry often violates machines and VDECS criteria. Installation problems have already been identified in the field, resulting in failed VDECS, invalidation of Roll Over Protection Structure (ROPS) certifications due to mounting, and excessive engine exhaust backpressures.
 - Excessive failure rates were documented with early installation in Switzerland. This will happen under the ARB rule also. Failures erase emissions gains, impact production and profitability, and result in additional costs to the equipment owner.
 - When customers begin dealing with three or more suppliers (VDECS supplier, machine manufacturer, will fitter, etc.), all supplying highly interactive products under warranty, the responsibility for resulting failures can become a highly debated issue. As it is or is not sorted out, the customer is left to pay.
 - Technical lab performance and durability testing of the VDECS by ARB in itself is not adequate testing to approve its use on actual operating equipment.

To address these issues an OEM verified package is understandably the desired solution by our customers. (EUCA5)

3. **Comment:** What we really want is an engineered system compatible with the equipment that it's going on. (GC4)
4. **Comment:** The regulation should be delayed until Caterpillar and other major manufacturers of tractors get their own technologies verified. (CAMARILLO3)

Agency Response: We recognize the availability of retrofit technologies developed by the manufacturers of the equipment is attractive to fleets. It is our expectation that some original equipment manufacturers will develop particulate filters for their equipment. For example, Caterpillar recently received verification of the Caterpillar Diesel Particulate Filter for some off-road equipment, and is

participating in the offroad showcase demonstration. However, we cannot guarantee that all original equipment manufacturers will move forward this way.

While staff understands that fleets may prefer to use retrofit technologies developed by OEMs, all retrofit manufacturers (including OEMs) must make the same demonstration as to the effectiveness and durability of their verified product. As discussed elsewhere in Chapter 2 of this FSOR, ARB's verification procedure ensures that even if VDECS are developed by manufacturers other than OEMs, they will be compatible with the engines on which they are installed, and will carry the same product and installation warranty. Because of this, we do not believe that retrofits developed by third party manufacturers are any less effective or appropriate for off-road applications than retrofit technologies developed by OEMs.

The regulation provides an incentive to original equipment manufacturers to develop retrofit solutions because it creates a demand from their customers for such products. If we had postponed the adoption and implementation of the regulation, the demand for retrofit solutions would have lagged and many OEMs may have chosen to wait even longer to develop retrofit solutions. Staff believes that the immediate need for emission reductions, and the assurances provided by ARB's verification program, requires that we move forward with retrofit requirements now in expectation that retrofit manufacturers (and OEMs) will respond to the market demand.

See also the responses in section III-A-6)c)i) in Chapter III-A-6 of this FSOR for a discussion of why the Board did not delay implementation of the regulation.

2)a)vi) Use of active VDECS

2)a)vi1) Active VDECS Not Feasible for Off-road Applications

- 1. Comment:** The Staff Report states that it is likely that many of the diesel particulate filters used would need to be actively regenerated, either through plug-in or through an on-board fuel burner, because the exhaust temperatures in some off-road applications are not sufficient to support passive regeneration. One VDECS vendor has informed us that their active VDECS will take 4 to 5 hours to regenerate. We are in the business to supply workover rigs to the petroleum industry. We are required to keep the well bore pressures under control at all times, and the engine on the rig is a major component in controlling the well. We cannot have a surprise shutdown of the engine due to a VDECS. (NWS)

Agency Response: There are several ARB verified retrofit systems that are passive and therefore do not need to be shut down for regeneration. These include devices manufactured by Caterpillar, and DCL International Inc.

ARB staff recognizes the need for more verified diesel emission control devices for use in off-road applications, and believes that for a number of reasons, that more will be verified soon. First, the regulation will create an inherent demand for retrofits, and we expect retrofit manufacturers will respond to meet this demand. In addition, the Showcase project is also expected to foster additional verifications of devices that not only achieve substantial diesel PM reductions, but also reductions in NOx as well. For additional information on the availability of VDECS, please see response III-A-2)a)i) of this FSOR.

2)a)vi)2) Regeneration On-site Not Feasible

1. **Comment:** Currently two of the three level 3 VDECS require high voltage electrical source to regenerate on a daily basis, and there is rarely such an electrical source in our field operations. (GC1)

Agency Response: There are a number of ARB verified retrofit systems that do not require an electrical source for regeneration. These include devices manufactured by HUSS, Caterpillar, and DCL International Inc.

ARB staff recognizes the need for more verified diesel emission control devices for use in off-road applications, and believes that for a number of reasons, that more will be verified soon. First, the regulation will create an inherent demand for retrofits, and we expect retrofit manufacturers will respond to meet this demand. In addition, the Showcase project is also expected to foster additional verifications of devices that not only achieve substantial diesel PM reductions, but also reductions in NOx as well. For additional information on the availability of VDECS, please see response III-A-2)a)i) of this FSOR.

2)a)vi)3) Time and Expense of Regeneration

1. **Comment:** The most significant objections to the required retrofit devices are the cost of compliance and the time and expense for regeneration. Off-road equipment equipped with one of the verified devices must be plugged in regularly for six hours to regenerate. (GLATKY)
2. **Comment:** I'm petrified of using VDECS. First of all, we've got a quote, for 450 horsepower engine, and it is \$23,000 for my VDECS to go on that engine. That's \$51 per horsepower. Now, the HUSS guy was here and he said that you can operate for two hours and then you can generate. There's a small problem. I operate ten to 12 hours a day. So if I operate two and regenerate 30 minutes, and operate two and generate, I'll never get home. (NWS4)

Agency Response: The regeneration time and frequency needed for a VDECS depends on many factors, such as the engine size, size and type of the DPF (passive DPFs require no regeneration time as the filter regenerates while the engine is operated), engine Tier level, how the vehicle is used, and the condition

of the vehicle on which the VDECS is installed. ARB staff acknowledges that some VDECS installed on older, larger engines may need to be regenerated more frequently than those installed on newer, cleaner engines. Additionally, VDECS installed on vehicles that have not been maintained properly will experience more frequent and lengthy regeneration times. However, it is difficult to say with any certainty what the regeneration time, which needs to be carefully considered by the fleet operator, will be for each vehicle. To assist fleet operators in retrofit selection during implementation of the regulation, ARB staff will be developing retrofit guidance, which will address such issues as proper VDECS selection, safety and feasibility of VDECS, appropriate cleaning and maintenance techniques for DPFs, and the need for proper and continuing engine maintenance.

For a discussion on VDECS hardware and maintenance costs, please see the response in section III-A-3(ix) in Chapter III-A-3 of this FSOR.

2)a)vii) This section intentionally left blank

2)a)viii) This section intentionally left blank

2)a)ix) Responsibility for Failure Contested

1. **Comment:** A retrofit is something you build onto the engine. Yes, there are some approved by CARB. Unfortunately they're not approved in conjunction with the manufacturers. So if you put it on a Caterpillar machine, and have an engine failure, it is not warrantable. Everybody keeps talking about the warranty. That's great on a device. But when you lose an engine that costs you \$50,000, who's going to pay for it? (H-CAT)
2. **Comment:** When customers begin dealing with three or more suppliers (VDECS supplier, machine manufacturer, filter, etc.) all supplying highly interactive products under warranty, the responsibility for resulting failures can become a highly debated issue. If it is not sorted out, the customer is left to pay. (EUCA5)
3. **Comment:** Those of us who attended the May 25th meeting in San Diego were able to review pictures of an installed after market PM trap on a machine provided by Gary Rohman at ECCO. The PM trap was mounted on top of the engine compartment, obstructing the view of the rear of the machine. When an after market PM trap is installed on a machine and an accident occurs while moving the machine in reverse - who will be responsible? The operator can say his view was obstructed. The manufacturer can say the machine was modified outside of original safety specifications for operator visibility. This leaves the liability at the feet of the equipment owner who was mandated to install the PM trap on the machine by CARB. What will insurance companies charge for General Liability to machine owners who have added PM traps, reducing or

removing manufacturer's liability on those machines? Will insurance companies accept that risk when this scenario is discovered? The manufacturer's liability for machine modification should remain with the machine manufacturers. Caterpillar dealer representatives have testified that the installation of PM traps on their machines will void engine warranties. Until the manufacturer's are held responsible and provide manufacturer approved PM traps for installation on the manufacturer's equipment - product liability will rest with the machine owners who must follow CARB mandates. By voting to adopt these proposed measures July26, CARB is forcing unnecessary risk and liability on machine owners (RMMC)

Agency Response: ARB's verification program is designed to evaluate the effectiveness of a retrofit device to reduce PM or PM and NOx emissions from specific diesel engines. As part of that evaluation, the compatibility of the device with the engine is considered through testing and in-field durability testing. Because the device is verified to be installed after the engine is placed in service, the approval of the engine manufacturer is not required (this is consistent with all devices that are found by ARB not to reduce the effectiveness of a required motor vehicle pollution control device under section 27156 of the Vehicle Code). A more complete description of ARB's verification program is provided in section B of Chapter VIII of the TSD.

VDECS are verified by the device manufacturer for specific engine families and may not be used in California on engines for which they are not verified. Under the verification program, the device manufacturer is required, among other things, to provide a warranty against engine damage caused by the VDECS. The minimum warranty period for devices verified for off-road applications is listed in Table III-A-2)a)ix)-1 below. To protect the end user and ensure the emission performance and durability of a device, only ARB-verified VDECS are permitted to be used in ARB's mandated, and most of its voluntary, retrofit programs.

Table III-A-2)a)ix)-1 - Diesel Emission Control Strategy Warranty Period

Engine Size	Minimum Warranty Period
At or above 25 hp and under 50 hp	4 years or 2,600 hours
At or above 50 hp	5 years or 4,200 hours

Should a VDECS cause an engine failure when the engine was properly maintained, then Title 13, CCR, section 2706, specifies that a VDECS manufacturer would be liable for the costs of repair and/or replacement to that engine so long as the device is still under warranty. It should be noted that under California law, an engine manufacturer is not permitted to void or otherwise refuse to honor an engine warranty simply because the engine has been retrofit with an ARB verified device. Only in the situation where it can be demonstrated that the verified device caused specific engine damage is the engine

manufacturer relieved of their warranty obligation; and in that case, the device manufacturer would be liable so long as the device is still under warranty.

Staff understands the commenter's opinion that there could be an advantage to having the engine manufacturer carry the device verification and associated warranty obligation. There is a limited, but growing, trend for this to occur. For example, in off-road applications, Caterpillar (a large manufacturer of off-road engines and vehicles) verified a DPF for certain off-road engines in January, 2008. Like any other device manufacturer, under the verification procedure, Caterpillar must warrant their device against defects, as well as any engine damage caused by that device. This includes the situation where the device is installed on non-Caterpillar engines for which it is verified. However, staff does not believe that devices that are verified by an engine or vehicle manufacturer offer any additional protections or assurances of engine compatibility relative to devices that are verified by third party vendors.

As discussed in Chapter IV of the Staff Report, and Chapter VII of the Technical Support Document, under the regulation if a fleet owner believes that a retrofit that is verified for a vehicle in his fleet cannot be safely installed, he may apply to ARB for relief. Upon presentation of supporting documentation, ARB's Executive Officer will determine whether the VDECS can be safely used on a specific vehicle application. For example, in some cases, installation of a VDECS may impair driver visibility; or may not be able to be safely mounted without damaging the structural integrity of the vehicle, or may cause other safety concerns. In such cases, the VDECS in question would not be required to be installed, even though it might be verified for the particular engine that is equipped on the vehicle.

The issue of VDECS developed by the original equipment manufacturers is discussed further in the response in section III-A-2)a)v) of this FSOR. The issue of safety concerns about VDECS installation is discussed in the responses in section III-A-2)a)ii) of this FSOR.

2)a)x) Need to Forecast Demand

1. **Comment:** Forecasting the demand for the various types of solutions that will enable fleet owners to meet the requirements of the proposed regulations requires economic modeling that considers at least the following: global, national, and state economic forecasts and business cyclical projections, a like set of data for specific businesses in which fleet owners are engaged, the impact of other regulatory actions either within California or elsewhere, and customer intentions regarding the proportion and quantities of each solution type that will be used to meet the regulations. (EUCA5)

Agency Response: We agree that engine and retrofit manufacturers will need to forecast the demand for solutions they provide. As many of these

manufacturers have been in business for decades and, no doubt, have experience forecasting demand for new products, and, as it is in their economic interest to do so, staff believes they will.

2)a)xi) Limited Resources Available for Developing Solutions

- 1. Comment:** The resources required to develop, obtain certification of, and launch the required emissions solutions (e.g. technical knowledge, development and innovative skills, experience, testing facilities, etc.), are finite and in high demand throughout the off-road equipment industry. Ongoing dedication of research and development resources toward meeting the federally mandated Tier 3 and Tier 4 non-road engine emissions standards by necessity have consumed our limited resources and will continue to do so through the implementation of Tier 4B. Unfortunately, the specialized physical resources and personnel required to develop solutions that will enable fleet owners to meet the proposed regulations cannot be instantaneously multiplied simply by increasing the monetary investment applied to the issue. (EUCA5)

Agency Response: We recognize that adequate supply of retrofit devices and new certified engines depends upon trained personnel and sufficient institutional expertise. As discussed in Chapter II of the Staff Report and Chapter VIII of the Technical Staff Report, we believe there will be adequate supply of new and used vehicles and retrofits to meet the demand created by the regulation. OEMs are already meeting and supplying engines certified to today's Tier 2 and Tier 3 engine standards. A database of engines certified to Tier 2 and Tier 3 standards is available on ARB's website at

<http://www.arb.ca.gov/msprog/offroad/cert/cert.php>.

In part, this is because staff expects the incremental increase in demand created by the regulation to be very small compared to existing nationwide demand for engines and vehicles. Further, as discussed in the response to comment III-A-2)c)i) in this FSOR, staff estimates little or no increase in incremental demand for new vehicles resulting from the regulation. Instead, we expect increased incremental demand mostly in relatively new, used vehicles.

In addition, we expect companies other than engine manufacturers to be working to develop retrofit solutions. Indeed, the majority of VDECS verified today have been developed by companies other than the original equipment/engine manufacturers (OEMs). Therefore, if the resources of OEMs are tied up with developing Tier 3 and Tier 4 engines, other companies can fill the need for VDECS.

Also, as discussed in Chapter IV of the Staff Report and Chapter VII of the TSD, in the event there is a lack of available retrofits, repowers, or new or used vehicles to meet the requirements of the regulation, fleets would not be penalized. As long as the fleet owner orders the required retrofit, repower, or

new vehicle at least four months prior to the required compliance date, the fleet owner would be able to count the new retrofit, repowered engine, or new vehicle just as if it had been delivered. The owner would need to place the new equipment or vehicles into operation immediately upon receipt.

The Executive Officer would also be able to grant additional time to fleets or groups of fleets if there were a delay in the availability of vehicles with interim or final Tier 4 engines.

2)a)xii) Insufficient Lead Time for Manufacturers

- 1. Comment:** The fact that the currently proposed regulation is based on macro requirements at the fleet average level means manufacturers will be expected to simultaneously supply solutions across a broad range of product types, models and horsepower classes. Emissions reduction requirements tied to introduction of new products enable CNH and other manufacturers to effectively apply the limited resources required to develop and produce lower emission engines over a timeline of a series of new product introductions. This is not the situation proposed by the CARB regulations, since fleet owners will individually determine not only which products, models and specific units they will address in order to attain required fleet averages, but also the type of solution they will apply to each unit or groups of units and the sequence in which they will do so. Federally mandated standards have generally provided four years product development lead time and implementation spread over three or more years. If the ARB approves this proposal in May 2007, lead time will be thirty-three months and the implementation effective 01 March 2010. This incremental set of variables further complicates the situation and increases the difficulty of responding adequately to the needs our customers will face if the proposed regulations are implemented.
(EUCA5)

Agency Response: We did not structure the regulation in anticipation of new engine technology that had not already been required by previous California and federal new engine standards. We recognize this regulation may alter demand, but as stated previously, the incremental change in demand is expected to be small. Further, the timeline is not as short as the commenter suggests; new technology is not necessarily required in the early years to meet the fleet averages. In large part, the fleet averages for a given year are the 10-year rolling averages of the new engine emissions rates; therefore, younger fleets will be able to meet the fleet averages without purchasing vehicles with new engines. Also, the BACT provisions require only technology that is available at the time of compliance.

As discussed in section of this chapter of the FSOR, we expect VDECS to be available to meet the requirements of the regulation, and – if a vehicle has no highest level VDECS – then the regulation exempts that vehicle from retrofit

requirements. Also, as discussed in Chapter IV of the Staff Report and Chapter VII of the Technical Support Document, the regulation would not penalize fleets for delays in the availability of retrofits, repowers, or new vehicles. As long as the fleet owner orders the required retrofit, repower, or new vehicle at least four months prior to the required compliance date, the fleet owner would be able to count the new retrofit, repowered engine, or new vehicle just as if it had been delivered. The Executive Officer will also be able to grant additional time to fleets or groups of fleets if there were a delay in the availability of interim or final Tier 4 vehicles.

Finally, the commenter's reference to four years of lead time and three years of stability are requirements set forth in federal Clean Air Act § 202(a)(3)(C) and are requirements that U.S. EPA must follow in establishing emission standards for new on-road heavy-duty diesel engines. The requirements do not apply to this off-road regulation. To the extent that fleets may elect to repower with new engines or purchase new vehicles, the regulation requires that certified new engines be used. Engines manufacturers certify these new engines pursuant to regulations previously adopted by ARB and U.S. EPA, and those regulations have provided necessary lead time, after considering numerous other issues, such as stability.

2)a)x)iii) Poor Installations of Retrofits

- 1. Comment:** ECCO has first hand experience regarding the poor installation of a HUSS VDECS which was installed by HUSS representatives. (ECCO5)
- 2. Comment:** At this time we are faced with only one device that can handle the majority of our horsepower. I am sorry to say I am not impressed with this company's knowledge with the kind of tractors we use and the job conditions that we deal with in the state of California. I have seen demonstrations of these units and I am sure they would work fine on a forklift or a small loader or on vehicles that work on a smooth surface. Saying that, it is my opinion with 40 years in the maintenance field of construction equipment that while the technology is becoming available the expertise of installation is severely lacking. The installation that I witnessed was lacking in professionalism. You can have the best product on the market but if you do not install it correctly it will fail. I have seen wiring and fuel lines installed in pinch points, exhaust tubing left laying on the hood with no insulation or shielding installed to avert a fire or the possibility of injury. 98 percent of the installation was secured with plastic tie straps and a lot of this was secured to the surfaces that they should not be attached to. The technology is on the verge of being successful, however installation issues are not. (CAMARILLO3)
- 3. Comment:** Most fleet owners question what the availability of CARB verified VDECS will be when they must start ordering them less than 2

years from now. At present, only the HUSS model does not require outside power to regenerate. Several companies who have had HUSS VDECS installed on their equipment have been dissatisfied with the installation and have paid more than CARB's cost estimates-this does not encourage the industry to spend millions of dollars on HUSS products until their installation improves. (TA)

4. **Comment:** Ecco was recently required to install a particulate filter on a 430 horsepower 988 loader. The installation was so poorly performed by the manufacturer that the Cat dealership will not release this machine back to us due to many safety concerns. In fact, next Tuesday Caterpillar, CARB, and others will meet to review this installation. It's a Huss filter, and it was installed by people from Huss. They just installed it at the Caterpillar facility. Caterpillar mechanics or personnel did not have anything to do with this. (ECCO6)
5. **Comment:** Those of us who attended the May 25th meeting in San Diego were able to review pictures of an installed after market PM trap on a machine provided by Gary Rohman at Ecco. The PM trap was mounted on top of the engine compartment, obstructing the view of the rear of the machine provided originally by the manufacturer. (RMMC)

Agency Response: As a Huss representative testified during the July 26, 2007 Board Meeting, the installation that commenters ECCO5, ECCO6, TA, RMMC, and CAMARILLO3 were referring to was an unfinished installation. During the Board Meeting, the Huss representative showed the finished installation; also, ARB staff inspected the vehicle and found nothing on the installation that was not correctable.

Staff recognizes that there will be a learning curve for installers just as there has been and will be for any new technology. However, retrofit manufacturers will be motivated to install retrofits in such a way that the technology will perform safely and reliably, otherwise competitors' technology will become preferred by fleet owners.

Indicative of how the market will respond to anticipated demand, within the first few months of 2008, the ARB has verified or conditionally verified two more Level 3 VDECS. At this time there are five Level 3 devices suitable for off-road application.

The South Coast Air Quality Management District and the ARB are currently conducting the Off-Road Diesel Retrofit Showcase. This program provides funding for the installation of retrofit devices on construction equipment on the condition that retrofit manufacturers intend to verify those devices. Currently, there are approximately 30 new retrofit devices in the verification process under this program.

The regulation only requires retrofits if they are verified as proven, effective, durable and warranted. In addition, the regulation never requires retrofits if they are not verified, will not work, or are not safe. If a vehicle does not have a highest level VDEC or if one cannot be installed safely, the regulation exempts that vehicle from the retrofit requirements.

Liability issues are addressed in the response in section III-A-2)a)ix) in Chapter III-A-2 of this FSOR. The safety and reliability of VDECS are addressed in the response in section III-A-2)a)ii) in Chapter III-A-2 of this FSOR.

2)a)xiv) NOx Retrofits Will be Available

- 1. Comment:** We feel strongly that the NOx devices needed for these tractors will be available by the end of 2008. That would take care of the second part of the rule. (CAMARILLO4)

Agency Response: If NOx retrofit devices become available, they will provide another option for fleets to comply with the NOx provisions in the regulation. The regulation gives fleets a variety of methods to meet the NOx provisions, including engine repowers, purchase of new vehicles, purchase of used vehicles, and installation of NOx retrofit devices.

2)a)xv) VDECS not Practical for Large or Small Vehicles

- 1. Comment:** After-market devices are impractical for our small equipment. (WPC2)
- 2. Comment:** Due to delays and changes to the regulation, i.e. adding NOx reductions late last year, manufacturers and contractors will have a difficult time meeting the standards. The tier 4 Engine will not be available until maybe 2015, current VDECS are impractical to use on large construction equipment. (NBC)

Agency Response: The regulation only requires retrofits if they are verified as proven, effective, durable and warranted. In addition, the regulation never requires retrofits if they are not verified, will not work, or are not safe. ARB's verification procedure is discussed in Section B of Chapter VIII of the Technical Support Document. If a vehicle does not have a highest level VDECS or if one cannot be installed safely, the regulation exempts that vehicle from the retrofit requirements. The section 2449(c)(27) definition of highest level VDECS provides that if the diesel emission-control strategy manufacturer and authorized diesel emission-control strategy dealer do not agree a device can be used on a specific engine and vehicle combination without jeopardizing the original engine warranty in effect at the time of application, then the device is not considered warranted. Therefore, if a VDECS is impractical for reasons that are also detrimental to the engine of the vehicle, that vehicle would be exempt from the

PM retrofit requirements. Also, section 2449(e)(8) provides that a VDECS that impairs safe operation of a vehicle is not considered highest level VDECS and is not required to be used.

Additionally, if a fleet owner does not want to install VDECS, there are other ways to fulfill the PM requirements of the regulation. A fleet owner can choose to add cleaner vehicles to the fleet, replace existing vehicles with newer ones, or repower with cleaner engines to meet the PM fleet average targets. Also, the retirement of older vehicles from the fleet can reduce the PM fleet average of the fleet, and potentially receive PM BACT retrofit credit. As stated in section 2449.2(a)(2)(A)1.b. of the regulation, a fleet that is reducing its total horsepower from one year to the next can receive PM BACT credit for Tier 0 vehicles that are retired.

For a discussion on adding NOx to the regulation, please see the response in section III-A-6)c)xi) in Chapter III-A-6 of this FSOR.

For a discussion on the timing of the regulation in relation to the release of Tier 4 vehicles, please see the response in section III-A-6)c)i) of this FSOR.

2)a)xvi) Section intentionally left blank.

2)a)xvii) Ash Disposal

1. **Comment:** There is no infrastructure for maintenance of the devices and disposal of the ash. No coordination has been done with state and federal license agencies for necessary hazardous waste handling and disposal points. (CIAQC7)

Agency Response: As stated in Chapter IX of the Technical Support Document, staff acknowledges that a negative potential impact from diesel particulate filters is the accumulation of ash on the filter. The principal source of the ash is fuel additives, engine lubricating oil, salts from environmental air, and motor wear. It primarily consists of oxides, sulfates and phosphates of iron, calcium, and zinc. Depending on the concentration of zinc, the ash may be classified as a hazardous waste.

Staff recommends that owners who install a DPF on a vehicle contact both the manufacturer of the DECS and the California Department of Toxic Substances Control (DTSC) for advice on waste management. DTSC personnel have advised ARB that it has a list of facilities that accept waste from businesses that qualify as a conditionally exempt small quantity generator. Such a business can dispose of a specific quantity of hazardous waste at certain Household Hazardous Waste events, usually for a small fee. An owner who needs specific information regarding the identification and acceptable disposal methods for this waste should contact the California DTSC. Because of the time and costs associated with filter maintenance, there are also efforts by industry to reduce the

amount of ash formed. Most of the ash is formed from the inorganic materials in engine oil, particularly from zinc-containing additives necessary to control acidification of engine oil – due in part to sulfuric acid derived from sulfur in diesel fuel. As the sulfur content of diesel fuel is decreased, the need for acid neutralizing additives in engine oil should also decrease. There are also a number of ongoing technical programs to determine the impact of changes in oil ash content and other characteristics of engine oil on exhaust emission control technologies, engine wear and performance.

It may also be possible to reduce the ash level in diesel exhaust by reducing oil consumption from diesel engines. Diesel engine manufacturers over the years have reduced engine oil consumption in order to reduce PM emissions and to reduce operating costs for engine owners. Further improvements in oil consumption may be possible in order to reduce ash accumulation rates in diesel particulate filters.

2)a)xviii) Retrofits May Damage Engines

- 1. Comment:** Your staff has suggested that Delta retrofit with VDECS for compliance. Who pays for the downtime when these unproven technologies destroy engines due to the increased back-pressure on turbochargers? There is a contractor in Southern California who suffers from this exact problem at this time! Slow down the mandatory VDEC installation until the potential damage to existing engines can be determined and corrected. (DCCI)

Agency Response: Staff does not agree with the commenter that VDECS will cause engine damage due to increased back pressure on engine components. To protect the end user, the regulation only requires and gives credit for diesel emission control systems that have been verified under ARB's Verification Procedure (title 13, CCR, sections 2700 et seq.), which is discussed in more detail in Chapter VIII of the TSD. ARB verification ensures that a VDECS has been demonstrated not to harm or damage engines on which it may be installed; and in the rare instance that a VDECS causes engine damage, that any damage caused by the VDECS is covered by the VDECS manufacturer according to the warranty provisions of the Verification Procedure. Under the Verification Procedure, the device manufacturer is required to provide a warranty against engine damage caused by the DECS. The warranty guarantees the retrofit's efficacy for 4 to 5 years, or 2,600 to 4,200 operating hours (whichever comes first, depending on engine size).

2)a)xix) Section intentionally left blank.

2)a)xx) GSE Testing Not Included in Verification

- 1. Comments:** A device qualifies for ARB verification after the retrofit maker demonstrates 200 hours of "compatible" operation with "one vehicle or

piece of equipment belonging to the initial emission control group for which it seeks verification.” Even for the one vehicle type tested, verification does not address the extent of technical or redesign work necessary to install the retrofit. To be found “compatible” with the particular vehicle type tested, the retrofit must not cause engine malfunction or damage, cause backpressure outside the manufacturer specifications, or hinder or detract from the vehicle or equipment’s ability to perform its normal functions. None of these issues were examined for GSE. While ARB examined the technical feasibility of retrofits for various types of construction equipment, ARB did not do so for GSE. In discussing the technical feasibility of DPF retrofits, ARB staff cites U.S. and particularly European experience in installing DPF retrofits on construction and mining equipment. None of the examples cited by ARB involved GSE. (POHLE)

Agency Response: GSE represents only 1 percent of the vehicles affected by the regulation and uses the same engines as other off-road diesel vehicles, and therefore, it would not be a good use of resources to require that all VDECS be tested specifically on GSE in order to be verified. However, as stated in section 2449(3)(8) of the regulation, if a VDECS manufacturer states that there is no safe or appropriate method of mounting a VDECS on the requesting party’s vehicle, then the VDECS will not be considered safe. Subsequently, the fleet can then apply to the ARB Executive Officer (EO) to find that the VDECS in question not be considered the highest level VDECS available for that application. Additionally, in absence of a manufacturer declaring the VDECS unsafe, a fleet may also submit other documentation to support its claims. See also the responses in section of this chapter of this FSOR.

We acknowledge that the verification process does not address the technical feasibility, extent of vehicle redesign, necessary lead-time, cost, and other issues involved in installing a retrofit into a particular vehicle; nor would that be appropriate. It would be impractical to attempt to verify installation details for each retrofit on every possible vehicle type since there are hundreds of off-road vehicle types, from dozens of manufacturers. If we required that retrofit installation details be verified ahead of time for every possible engine and vehicle combination, verification would become astronomically expensive for applicants, and it would be impossible for ARB to issue verifications in a timely manner. The issue of whether a retrofit can be installed on a specific vehicle is addressed not in the verification but in the implementation of the in-use regulation affecting the vehicle. However, a VDECS will not be considered the highest available VDECS for a particular application if the VDECS manufacturer and authorized dealer cannot agree that the VDECS can be used on the particular application without jeopardizing the warranty. It is important to note, however, that ARB encourages verification applicants to supply data for the most challenging application possible, so as to be able to issue as broad a verification as possible.

Finally, we do not believe that many GSE fleets will use VDECS as the primary strategy to reduce their PM emissions. Airline stakeholders told staff several times during the workshop process for the regulation that they prefer to comply without installing retrofits, and ARB understands that they will elect to replace many of their diesel vehicles with electric vehicles. The off-road regulation contains section 2449(d)(1)(A)3.b., which states that any electric vehicles added to a fleet between 2010 and 2016 will receive double credit (i.e., all electric vehicles added to the fleet will count as double the horsepower with PM and NOx emission factors of zero). This provision, which was added to the regulation at the request of the Air Transport Association (ATA), will allow GSE equipment to be replaced with electric vehicles, and potentially lower a GSE fleet's PM averages enough to avoid installing PM VDECS. The electric double credit provision lasts through 2016, at which time Tier 4 vehicles will be available, allowing GSE fleets to upgrade to Tier 4 vehicles that do not require the installation of VDECS.

2)b) Repowers

2)b)i) Availability of Repowers

- 1. Comment:** There will be insufficient quantities of engines available to be used for repowering. ARB over-estimated the number of new engines to be used for repowering which will be available for sale. (CBCC3), (RJB2), (EUCA5), (AGCA3), (SHAWM1) (RMMC2)
- 2. Comment:** There will be an adequate supply of new equipment and repowers. (SCAQMD2)

Agency Response: We agree with the comments of SCAQMD2. As discussed in Section H of Chapter VIII of the Technical Support Document, staff believes that enough engines will be available to fleet owners who elect to repower older vehicles (that are capable of having their engines replaced) with a cleaner engine. Also, as discussed further below, the regulation contains provisions that protect fleets from penalty if they encounter delays in the availability of engines for repowers.

The turnover requirements imposed by the regulation will require a maximum of 10 percent (eight percent in the initial years) of a fleet's statewide horsepower to turn over each year. The baseline natural rate of turnover of the statewide fleet is about 5 percent per year. Thus, the regulation will at most require 5 percent more turnover per year than normal. The regulation affects about 180,000 off-road vehicles. Therefore, the maximum annual (incremental) increase in demand for Tier 2 or better vehicles and engines in California will be an additional 5 percent, or about 9,000 per year. This demand will be satisfied through a combination of engine repowers, purchase of new vehicles, purchase of used vehicles, and installation of NOx retrofits. (As discussed further in the responses in section III-A-2)c) of this FSOR, even if all the demand were

satisfied with new vehicle purchases, 9,000 vehicles per year would represent only about 3 percent of national off-road vehicle sales and so would not be expected to represent a significant change in the national market for off-road vehicles).

As discussed in Chapter XI of the Technical Support Document, and Chapter VII of the Staff Report, the number of vehicles expected to be repowered under the regulation is estimated to be only a small percent of the overall compliance strategy. ARB staff estimated that only 3.5 percent of the statewide fleet would be repowered for compliance with the off-road regulation. In our analysis, repower options were conservatively assumed to be unavailable for vehicles with engines smaller than 250 horsepower (hp). This is conservative because some manufacturers already have pre-engineered engine kits for these size engines, and repowers have been accomplished for engines less than 250 hp, including engines below 100 hp. Additionally, the analysis method only assumes a repower is considered for vehicles that were turned over more than 10 years earlier than normal. In other words, if a vehicle is likely to be replaced soon, then it is expected that the condition of the rest of the vehicle would not be worth the cost of upgrading the engine and keeping it in the fleet. Repowers with Tier 4 engines were not assumed to occur, due to the complexity and larger sizes of Tier 4 engine packages. However, with experience, repowering with a Tier 4 engine may become viable.

If a fleet encounters delays in the availability of engines for repowers, the manufacturer delay provisions in section 2449(e)(6) of the regulation provide that, as long the fleet places an order for the engine four months ahead of the compliance date, the fleet will not be penalized for that delay. Section 2449(e)(9) "Compliance Flexibility for Delays in Availability of Tier 3 or Tier 4 Vehicles" allows the Executive Officer to grant compliance extensions if there are delays in the availability of Tier 3 or 4 vehicles.

A more detailed description of the repower assumptions in the ARB economic model is given in Chapter III-A-10 of this FSOR. For additional information regarding the feasibility of repowers, please see the response to III-A-2b)ii) in Chapter III-A-2 of this FSOR.

2)b)ii) Feasibility of Repowers

- 1. Comment:** The only engines available to be used for repower are engines that meet current emissions standards. (MCQUEEN1)
(MCQUEEN2)

Agency Response: So long as the replacement engine is cleaner than the engine being replaced, engine manufacturers are allowed to sell engines that meet older (i.e., lower tier) emission standards for repowering.

- 2. Comment:** Many vehicle types cannot be repowered. ARB overestimated the number of vehicles that could be repowered. (MCQUEEN1) (MCQUEEN2) (CLKCS) (CIAQC1) (MC) (CIAQC7) (CBCC3) (RJB2) (AGCA3) (SHAWM1)
- 3. Comment:** Upgrading older diesel-powered off-road equipment with Tier 3 devices is not cost-effective. These newer Tier 3 engines require much larger cooling systems, electrical systems for computerized engines, and heavier-duty transmissions, rendering the upgrade of older equipment prohibitively expensive. (GLATKY)
- 4. Comment:** There are a limited number of pre-engineered repower solutions available. (H-CAT) (MC) (CIAQC7) (CAMARILLO4) (CAMARILLO8) (DORAZIO2) (PCCA) (ECCO4) (QC) (SHAWM1)
- 5. Comment:** Engine packages used in repower applications are larger than the original engine packages and do not fit in older vehicles. (GLATKY) (MCQUEEN1) (MCQUEEN2) (MCQUEEN3)
- 6. Comment:** It is not possible to repower with a Tier 4 engine. (HCC)
- 7. Comment:** It is unknown if sufficient engineering resources can be devoted into providing repower solutions during the timeframe set in the regulation. (ECCO4) (AGCA3)

Agency Response: As discussed in Chapter XI of the Technical Support Document, and Chapter VII of the Staff Report, the number of vehicles expected to be repowered is estimated to be a small percentage of the overall fleet. We recognize that repowers are not possible for most vehicle types, and the reasons include the difference in the size of the engine packages (newer, cleaner engines are typically larger than the engines that they replace), lack of available pre-engineered repower solutions (i.e., engine kits), and other variables.

In the Staff Report and Technical Support Document, ARB staff estimated that only about 3.5 percent of the statewide fleet would be repowered as a means of compliance with the regulation. In our analysis, repower options were conservatively assumed to be unavailable for vehicles with engines smaller than 250 horsepower. This is conservative because some manufacturers already have pre-engineered engine kits for these size engines, and repowers have been performed in vehicles having engines less than 250 hp, including engines below 100 hp. Additionally, staff's analysis only assumed that repowers would be considered in vehicles that have more than 10 years of normal life left, and that they would not occur in older vehicles that we would expect would normally be replaced with a new vehicle. In other words, if a vehicle is near the end of its normal life, then it is expected that the condition of the vehicle would make it not worth the cost of replacing just the engine and keeping the vehicle in the fleet.

Repowers with Tier 4 engines were not assumed to occur, due to the complexity and larger sizes of Tier 4 engine packages. However, with experience, repowering with a Tier 4 engine may become viable.

Through the Carl Moyer grant program, more than 300 diesel off-road vehicles such as scrapers, wheel loaders, compactors, tractors, excavators, and rough terrain forklifts have been repowered. The new engines used in repower applications funded through the Carl Moyer grant program have been certified to the Tier 1, 2, or 3 standards, with approximately one-third being Tier 3 engines. The sizes of the engines repowered in the Carl Moyer program range from less than 100 horsepower to over 600 horsepower. In almost all cases, the repower engine is from the same manufacturer as the original engine, although a few are from a different manufacturer.

We have always acknowledged that while some vehicle types are good candidates for repowering, many vehicle types are not. Because of this, the regulation does not require repowering vehicles; it is one of several compliance options available to fleets.

As we have evaluated the actions fleets must take to meet the fleet average emission targets of the regulation, we do not believe that fleets will need to be composed solely of the newest engines available to meet the fleet average emission targets. As discussed in Chapter XI of the Technical Support Document, the targets are based on a mix of vehicle turnover to newer (not necessarily new) vehicles, significant retrofitting, and some repowering. The fleet average emission targets were established based on the engine standards for a given horsepower category. The targets are phased-in to coincide with new, cleaner engines being available. A compliant fleet, even in 2020, may still retain vehicles with Tier 3 engines. The fact that fleets do not need to be 100 percent Tier 4 in order to comply with the regulation in the final years is discussed in Chapter III-A-3 of this FSOR, in the response to comment III-A-3)a)i)2. Before Tier 4s are available, fleets may comply by moving to Tier 2 or Tier 3 through vehicle purchase or repowering, by applying retrofits, and by retiring their dirtiest, oldest vehicles.

Finally, it is important to note the specialty vehicle provisions in the regulation specify that if a repower is not available for a vehicle and no cleaner used vehicle is available, the vehicle is exempt from the turnover requirements.

A more detailed description of the repower assumptions in the ARB economic model is given in Chapter III-A-10 of this FSOR.

For additional information regarding the cost of repowers, please see the response to comment III-A-3d)viii) of this FSOR.

For additional information regarding repower availability, please see the response to III-A-2b)i) in Chapter III-A-2 of this FSOR.

2)b)iii) Down Time for Repowers

- 1. Comment:** A vehicle has to be out of service for too long, two to three months, to install a repower. Thus, for the larger equipment (haul trucks and loaders) in our fleet, repowering is not a viable option because if we took the equipment out of service for several months, we would not be able to meet the production levels necessary to serve our customers.
(BMM1)

Agency Response: It is important to note that the regulation does not require that vehicles be repowered; it is simply one option available to a fleet. As discussed in Chapter XI of the Staff Report, and Chapter VII of the Initial Statement of Reasons, the number of vehicles expected to be repowered under the regulation is estimated to be only a small percentage – about 15 percent - of the overall horsepower in the fleet. The remaining horsepower expected to be brought into compliance through accelerated turnover.

However, staff understands that any vehicle downtime, whether for scheduled maintenance, repairs, or upgrades (including retrofit), may be difficult for a company to absorb. However, vehicle downtime occurs today without the regulation, and most fleets have learned how to make accommodations to handle it. Unscheduled repairs are usually the most difficult, because such occurrences usually happen unexpectedly and the company has to address the problem immediately. Scheduled maintenance and upgrades are typically easier to prepare for and schedule because the company can anticipate when the vehicle will be down. In many cases, a company can schedule such work to take place during slow industry periods (such as in the offseason winter time for construction vehicles), or between jobs for that vehicle. It is this type of downtime that the regulation envisions vehicle upgrades would typically occur. In fact, in the regulation, fleet owners must report information on March 1 of each year regarding each vehicle that will be affected by the regulation over the next year. ARB staff selected this date after being informed that it is common for companies to utilize the winter offseason to make their decisions regarding fleet changes for the upcoming year. While this is a common industry practice, there certainly will be situations where there may not be an extended downtime period for a vehicle. In those situations,, a company has the option of renting a vehicle to fill in temporarily for the vehicle being serviced.

It has been noted that if a repower has not been previously been done on a specific vehicle and engine type, or if a particular installation facility is inexperienced with a specific vehicle/engine combination, a repower could take two months or more. However, staff believes that the time that it will take to perform this work should be able to be determined prior to any work commencing, and that a fleet will have the ability to take this timing into

consideration in determining when the work can be scheduled. ARB's experience with repowers through the Carl Moyer program is that a typical length of time to repower a large off-road construction vehicle when the repair shop is experienced and kits are pre-engineered is between two to four weeks, even when major chassis and electronic work is required. For smaller machines, a repower can typically be done within a week. Staff believes that as repowers become more prevalent and shops become more experienced, the time to perform repowers will shorten, and the costs will drop as well.

2)c) New Vehicles

2)c)i) Availability of New Vehicles

- 1. Comment:** There is not enough retro or new equipment that exists to meet the standards, and there is little on the horizon. Where there is some equipment available it is very expensive and not well proven yet. (AWD)
- 2. Comment:** Tier 4 engine technology is yet to be developed. No manufacturer has a functioning Tier 4 engine in their development laboratories today. Federal EPA guidelines allow the manufacturers until 2015 to complete the development of this technology. (EUCA1)
- 3. Comment:** CARB claims that there will be adequate supplies of retrofit equipment and replacement machines and engines to meet the requirements of their regulation. However, all equipment manufacturers have indicated that the demand created by CARB's regulation will significantly exceed the availability of the required equipment. California construction capacity to meet the regulation is limited by the availability of equipment. (EUCA1)
- 4. Comment:** Equipment manufacturers are global companies. U. S. manufacturers are currently shipping 34 percent of their machines to South American, Asian and European markets. California construction companies have to compete for equipment in this environment. Manufacturing capacity is limited. Current equipment backorders stretch out for two years on many categories of equipment. Roughly 7,000 new pieces of equipment have been sold in California each year for the last dozen years. It will take more than two decades to replace the existing fleet based on this historical average. (EUCA1)
- 5. Comment:** Until the equipment that meets your proposed requirements becomes available, it is patently absurd to require contractors to buy it. (EUCA1)
- 6. Comment:** Specific to the role of manufacturers or other solution providers, fleet owner have voiced concerns about availability of sufficient

quantities of new equipment, repower engines and certified after-treatment, as well as dealer installation resources for retrofit solution, to meet the emissions targets and timetables of the proposed regulations. (EUCA5)

7. **Comment:** Certain T4 equipment may not even be available until 2015 per Federal EPA rules; how can subcontractors comply prior to then? (ASA)
8. **Comment:** The regulation is unreasonable because the technology to repower or replace does not exist. (PCCA)
9. **Comment:** While the California market is large, it is not driving the international market. The largest producers will fulfill the demands that are easiest and more cost effective for them. Already waiting time for new equipment deliveries are stretching into months in California. (AE)
10. **Comment:** Manufacturers are not going to be able to supply the 15,000 pieces a year that it's going to take to replace the current fleet at the rate you want to get where you want to be in 2020. But the issue is this: When you look at how you get to the 2020 goal, you 85 percent of the fleet in California is Tier 0 and Tier 1 equipment; 85 percent of 165,000 pieces. All of that has to be gone essentially by 2020. The only way to make that work, by and large, is replacement. And the manufacturers simply cannot ship, nor can the industry afford to buy, 15,000 pieces of new equipment every year for the next ten years. If you buy a Tier 3 engine today, regardless of what your staff says, it doesn't meet the 2020 criteria. You have to do something to it. You have to do something to every single piece of equipment in your fleet today. So to say that the technology's available is not true, because the one engine that complies isn't going to be available until 2015 in those higher horsepowers. We're unsure then that it will be available. (CBCC3)
11. **Comment:** The proposed regulation is based on meeting a Tier 4 emission level which will not be available in the 175 to 750 horsepower range until 2014. Without having the option to purchase the final and permanent Tier 4 emission engines, companies will be required to spend billions of dollars to meet this regulation. Most of the current retrofit and re-power solutions...can only be considered as band-aid requirements to meet an unrealistic regulation. Every one of these band-aid retrofits will be required on every piece of equipment at least once during the life of the regulation, and in many cases, two or three times. (ECCO2) (ECCO5)
12. **Comment:** As we look forward to the Tier 4 off-road emissions regulations for machines and engines that phase in beginning in January 1, 2011, it is our intent to build on our historically successful track record.

In fact, we already have a line of sight to the technologies necessary to meet Tier 4 emissions regulations. With that being said, it will be a challenge for us and all manufacturers to develop, certify and introduce new emission complaints for many portions of their product lines in the time window provided for by emissions regulations. In previous transitions years, the ARB/EPA “flex” program was available to address the business challenges of introducing broad changes into the majority of a company’s product line in a very short time frame by allowing the staggering of some product introduction. Unfortunately for California equipment owners, this program will not be a viable option since they will be addressing aggressive fleet average targets. At this stage, it is unreasonable for Caterpillar – or any manufacturer – to guarantee they will have all the products and service capacity necessary to perform the work without clear definition of the regulatory requirements and the information necessary to reliably forecast specific customer needs. In fact, until the proposed rule is finalized it will remain a moving target – as demonstrated by the significant changes made recently where the rule has gone from being a strict PM rule to one that now addresses both NOx and PM. There are still many unknowns associated with this rule including its ultimate extent and impact on our customers. One primary issue will be how short of a window will diesel engine and earthmoving machine owners have to address their fleet averages. There is risk that the proposed rule, if implemented as currently conceived will not provide sufficient lead-time for manufacturers to fully support California customers. Should that happen, it will not be an issue of the technology being unavailable - for while meeting the emission standards will be very challenging - it is Caterpillar’s intent to meet ARB/EPA time lines. (ECCO3) (AGCA3)

13. Comment: John Deere expects to have new product available in sufficient quantity to meet both normal demand associated with customer needs during implementation of the Interim and Final Tier 4 nonroad regulations and increased demand arising from ‘extra’ fleet turnover stimulated by California’s In-Use Off-Road Vehicle rule. The challenges associated with meeting the Tier 4 regulations cannot, however, be minimized. Unprecedented effort and resources are being devoted to developing entirely new engine and equipment platforms to meet Tier 4, with many technical and infrastructure issues currently unresolved. The flexibility provisions of these regulations could result in Deere and other manufacturers not having a full Tier 4-compliant product line available at the initial Interim and Final Tier 4 implementation dates. (ECCO4) (AGCA3)

14. Comment: The capacity of construction equipment suppliers to ramp-up production of new model equipment, particularly if the replacement engine technology is not fully conceived and developed, is constrained. If the regulations cause a noticeably longer back-log in equipment delivery this

in turn could reduce firms' ability to effectively complete projects, with associated impacts on cash flows as well as risks of profit reductions in cases where contracts include schedule delay-related penalties.
(CIAQC1) (CIAQC6) (AGCA3)

15. Comment: This regulation will require the replacement of 85 percent of the existing 165,000 machines. It will require 140,000 new pieces of equipment. The manufacturing capacity does not exist to deliver that much new equipment to California. (CIAQC7)

16. Comment: We are concerned about the equipment manufacturers' ability to provide the quantity of Tier 3 and Tier 4 equipment and VDECS that will be needed within the State. CARB has presented information that concludes that heavy equipment manufacturers will be able to support replacing, repowering and retro-fitting the majority of the State's over 200,000 off-road diesel equipment fleet in the next decade. Both conclusions are wrong. (RJB2)

17. Comment: The Rule is based on Tier 4 technology and the Tier 4 engines will not be available until 2014. We cannot afford to repower now and then again after 2014. (DER1)

18. Comment: Most of this rule relies on filtering technology that has yet to be proven and on Tier 4 technology that has not been developed yet. Most manufacturers have stated that they will be hard pressed to produce the number of new machines and retrofit engines to meet demand. I see the rule allows for some delays up to two years in some cases, but I can see the delays getting to be 3 to 5 years for new equipment. How can the industry plan around that? I buy equipment to meet needs in the current time frame. I can't stand to have any delays in acquiring needed equipment. (LAMNO)

19. Comment: Between 1984 and 2005, that's a 21-year period, not a single workover rig was built. So, if that is true, the only opportunity we have is for repower. (NWS4)

20. Comment: We strongly believe that engine and retrofit manufacturers, the used-equipment market, and suppliers and installers will not be able to meet the demand that the rule would create for equipment essential to the construction industry. As a threshold matter, equipment manufacturers have indicated that the demand created by ARB's regulation would exceed the availability of the required retrofit devices and replacement engines and machines. The regulations would accelerate the retirement of older equipment in anticipation of its replacement with new machines equipped with Tier 4 engine technology. EPA standards allow engine

manufacturers until 2015 to complete the development of this technology. (AGCA3)

21. Comment: Fleet owners have voiced concerns about availability of sufficient quantities of new equipment, repower engines and certified after-treatment, as well as dealer installation resources for retrofit solutions, to meet the emissions targets and timetables of the proposed regulations. CNH is dedicated to meeting customer needs, including those created through regulation or legislation. As a manufacturer, we fully intend to make every effort to develop the solutions fleet owners of our brand of equipment may need to meet requirements imposed on them by the State of California. However, the combined effect of the nature of the proposed regulations, uncertainty regarding the final form of the regulation, and the extreme difficulty of forecasting individual customer needs for the many CNH legacy products mean that despite the desire and commitment of CNH to fully support the owners of our brands of equipment, we cannot commit to the future availability of the retrofit products required to meet the proposed regulations. (AGCA3)

22. Comment: We feel it is prudent to call to the Board's attention that mandating rollover for NOx reductions beginning in 2010 fails to capture the significant NOx and PM reductions that equipment manufacturers will meet with Tier 4 engines by 2015. This is compounded by the structure of the rule with operators making adjustments to their fleets in the previous year to meet the compliance date of the following year; that is 2009 equipment will be the equipment available to meet the 2010 compliance date and 2014 equipment the 2015 compliance targets. This is particularly important for the mining industry where our equipment tends to be larger on average than construction firms. By forcing fleet managers to buy Tier 3 equipment, which may have a life of decades, they are emitting 80% more NOx than if they bought a Tier 4 a few years later. (CALCIMA)

23. Comment: Where will affordable and viable equipment come from? (DMCI)

24. Comment: It is important to note that the equipment required to meet the new CARB rules is not available or manufactured. Under the original rules it is contemplated that equipment manufacturers would meet the CARB goals, but the recent changes will make attaining these goals impossible. (MC)

25. Comment: There will be equipment shortages because the demand for new equipment as all of the other contractors struggling for survival will be competing for the same equipment. (WPC1)

Agency Response: As discussed in Section H of Chapter VIII of the Technical Support Document, we believe sufficient new and used vehicles will be available to satisfy the regulation's requirements. The baseline natural rate of turnover of the statewide fleet is about 5 percent per year. Staff has estimated that the average annual increase in turnover due to the regulation is approximately 2.5 percent or about 4,500 vehicles per year. Further, as described further in the response in section III-A-3)f)i) in Chapter III-A-3 of this FSOR, the increased demand would be mostly for relatively new, used vehicles; staff estimate little or no increase in demand for new vehicles. To put these 4,500 vehicles in context, this number is approximately 1.5 percent of national off-road vehicle sales.

For those fleets unable to meet the emission targets, the BACT turnover requirements will require a maximum of 10 percent (eight percent in the initial years) of a fleet's horsepower to turn over per year. Thus, the regulation will at most require 5 percent more turnover per year than normal.

Engine and vehicle manufacturers state that they will meet the demand for new vehicles and engines. Even the comments from engine and vehicle manufacturers above (Comment 12 and 13, for example) generally indicate manufacturers plan to comply with the new engine standards without a problem. The regulation also contains provisions for compliance extensions if a fleet experiences long lead times after ordering equipment, or if vehicles with Tier 3 or Tier 4 engines are not available:

If a fleet owner and seller had entered into contractual agreement for the purchase of new equipment or new vehicle at least four months prior to the required compliance date, the fleet is in compliance even if the equipment or vehicle cannot be delivered due to manufacturer delay.

There is a provision in the regulation for compliance extension for fleets due to delays in availability of vehicles with new Tier 3 or new Tier 4 engines, specialty vehicles, i.e., a vehicle for which no used vehicles with cleaner engine that can serve an equivalent function or perform equivalent work is available, that have no repower available are exempt from turnover requirements.

Staff agrees with the manufacturers that repowers with higher tier engines will be a challenge, and staff has assumed only a few percent of the overall solution will be repowers. More detailed descriptions of feasibility of repowering and assumptions in the ARB economic model pertaining to repowering are given in responses in section III-A-2)b)ii), and in Chapter III-A-10 of this FSOR.

The regulation's NOx fleet average emissions targets are phased-in over time to coincide with newer, cleaner engines becoming available. Staff did not establish the fleet targets to require fleets to purchase new vehicles. As discussed in the Technical Support Document Chapter XI, the targets are based on a mix of vehicle turnover to newer (not necessarily new) vehicles, and by a small percent

of engine repowers and installation of NOx retrofits. Many compliant fleets, even in 2020, will have Tier 3s. Staff estimates that approximately 40 percent of the statewide fleet will be non-Tier 4 in 2020. The fact that fleets do not need to be 100 percent Tier 4 even in the final years in order to comply with the regulation is discussed in Chapter 3, in the response in section III-A-3)a)i)2).

We acknowledge that final Tier 4 engines in some horsepower groups will not be available until 2014 or 2015. As discussed in the responses in Chapter III-A-1 of this FSOR, however, the need for NOx and PM reductions from off-road vehicles is immediate, and therefore the requirements of the regulation must necessarily start before the introduction of Tier 4 and Tier 4 Interim vehicles into the off-road market.

Before Tier 4s are available, fleets may comply by moving to Tier 2 or Tier 3 through vehicle purchase or repowering, by applying retrofits, and by retiring their dirtiest, oldest vehicles. Modeling has shown that if fleets diligently choose their vehicle purchases to comply with the regulation in future years, they would not have to replace those vehicles again. On the other hand, if a fleet owner complies in the early years by purchasing the very oldest vehicles allowed under the rule, they will likely have to turnover those vehicles to comply with the rule in later years. Further information can be found in Chapter II-A-6 of this FSOR, in response in section III-A-6)k)v).

Therefore, based on the arguments above, we do not believe there will be a shortage of new vehicles available for compliance with the regulation.

The availability of retrofits is addressed further in response in section III-A-2)a)i) in Chapter III-A-2 of this FSOR.

26. Comment: Tier 4 technology at this stage depends on the availability of fuel additives (urea or ammonia are the most frequently mentioned) as well as selective catalyst reduction and particulate filter technologies. Federal EPA says it will not approve Tier 4 systems that can run without these additives. There is no fuel infrastructure to deliver these products. (EUCA1)

Agency Response: We agree, but expect that such an infrastructure will develop. To meet the most stringent current diesel engine exhaust emissions NOx standards worldwide, engine manufacturers have employed selective catalyst reduction (SCR). SCR systems use a specific liquid injected into the exhaust stream which reacts with a catalyst to reduce NOx emissions. This liquid is urea-based. These engines, which were certified using SCR, have been in use since early 2005 in several locations of the world. For these engines to operate, a distribution system for the SCR liquid has been established in the regions of the world where SCR systems are employed to meet the exhaust standards. A similar distribution network is envisioned for the United States,

when 2010 emissions standards for on-road heavy-duty diesel engines will require wide-spread use of SCR systems on new engines. The distribution network for the SCR liquid in the United States for on-road heavy-duty vehicles will be in place several years before off-road diesel engines will require it. Therefore, a distribution network for off-road vehicles will be easier to establish, based on experience of the on-road distribution. In addition, although not widespread, currently many stationary engines, such as on-site generators, use SCR systems, and require the accompanying liquid to be brought on-site.

At this time, there are several companies working with ARB to verify retrofit SCR systems for on-road diesel engines. In addition, one automotive manufacturer recently announced they will begin to sell in the United States diesel-powered cars and SUVs with engines equipped with SCR, beginning in late 2008. The SCR systems require SCR liquid to operate.

2)c)ii) Provisions for Tier 3 Vehicle Delay

- 1. Comment:** Staff should add provisions for delays in the availability of vehicles with Tier 3 engines. Given the small market that GSE represents for original equipment manufacturers, the airlines often experience delay in obtaining new GSE units that incorporate the latest engines -- with a number of carriers now reporting delays in obtaining units that incorporate Tier 3 engines, which have been nominally available since model year 2006 (for certain horsepower ranges). Similar delays are expected for GSE that incorporate Tier 4 engines, after those engines are nominally available for off-road purposes. While, for certain types of delay, the proposed regulation allows for compliance extensions (sometimes requiring a formal request and demonstration to the Executive Officer), the potential for delay nonetheless further complicates planning (particularly for delays that do not qualify for the compliance extension already in the regulation. (POHLE)

Agency Response: Although the regulation has provisions for specialty vehicles, provisions for manufacturers delays, and provisions for vehicles with Tier 4 engines being delayed, staff agrees that delays regarding vehicles with Tier 3 engines were not adequately addressed (i.e., if a vehicle with a Tier 3 engine could not be ordered). Therefore, in the Third Notice of Public Availability of Modified Text and Availability of Additional Documents released on March 5, 2008, we extended the provisions for compliance flexibility for cases of delays in availability of Tier 4 engines in section 2449(e)(9) to Tier 3 engines as well. Now, the Executive Officer may grant an extension to a fleet if vehicles meeting the Tier 3 emission standards are not available to meet the fleet's needs.

2)c)iii) Failure of New Engines to Operate Properly

- 1. Comment:** The Rule does not adequately account for the real possibility that new equipment (Tier 3 and 4) will fail to operate properly or as

- intended, necessitating increased use of existing equipment or other changes, and potentially denying or limiting the expected emissions benefit from the new equipment. (POHLE)
2. **Comment:** The CSIA is also worried that the new equipment may fail to meet operating specifications and needs. If new Tier 3 or Tier 4 engines do not operate our operators cannot achieve the needed fleet turnover to meet the fleet average targets. (CSIA)
 3. **Comment:** The technology is not ready. You heard about the company that bought seven pieces of the newest equipment. Already 12 workdays have been lost while the equipment was in the shop getting repaired. On one unit the dashboard caught fire. (VCE2)
 4. **Comment:** The Rule does not account for the real possibility that new equipment (Tier 3 and Tier 4) will fail to operate properly or as expected, necessitating increased use of existing equipment or other changes that cannot be predicted sufficiently in advance to allow any assurance that a fleet operator can plan for, achieve, and maintain compliance with the regulation. Similarly, the technical challenges and likely delays in obtaining and integrating new retrofit and engine technologies into the GSE fleet make fleet planning to achieve a moving target virtually impossible. (ATA1)

Agency Response: New engines are certified to meet appropriate emission standards, and warranted by the engine manufacturers to operate properly. This regulation will increase the rate of turnover to newer, cleaner engines and vehicles; it will not affect the design and functionality of new engines and vehicles.

If manufacturers delay releasing new engines because they require additional time to develop properly operating engines, section 2449(e)(9) of the regulation provides for compliance extensions for fleets due to delays in the availability of vehicles with Tier 3 or Tier 4 engines.

2)d) Technology Lacking to Address Both PM and NOx

1. **Comment:** The proposed regulation effectively forces fleet operators like Sukut to use VDECS, but VDECS are not a long term solution in meeting the stated goals of the regulation, i.e., to achieve both PM and NOx reductions. VDECS are nothing more than a band aid solution, and they merely create a NOx dilemma. Had verified VDECS been available in 2001, when Sukut began the fleet modernization campaign, and had those devices vs. repowers been installed, we would now be facing a scenario of non-compliance with NOx, given the pending rule. VDECS in their current form do not address NOx. So I ask you, what would have been

gained had we installed VDECS on Tier 0 equipment then, and what will be accomplished by forcing the use of that technology at the inception of the pending rule? (SUKUT2)

2. **Comment:** According to industry experts, there currently is no diesel engine that is capable of addressing both PM and NOx emissions. This absence of technology and availability make the current proposal unrealistic and unlikely to result in meeting targets under these rules. In some cases the engines and equipment necessary to meet the standards will not be available until 2014. (ECHAMBER)

3. **Comment:** Adding the regulation of NOx emissions to the proposed regulations requires equipment technology that is not general utilized today. Simply stated, there is currently no diesel engine that is capable of addressing both PM and NOx emissions. (LACN)
4. **Comment:** We see VDECS as our very last solution because they do not give you NOx reductions. And we do not want to continue in this cycle to touch and we retouch the equipment. Our strategy right now is to take the remaining Tier 0's in our fleet and either retire them, where appropriate, or repower them. But we want to go forward with the best technology. Then as Tier 1's need to be rebuilt, we'll update those to Tier 3 or Tier 4 if Tier 4 is available in the future. Tier 4 for our horsepower is not available until 2014. (SUKUT4)
5. **Comment:** There currently is no diesel engine that is capable of addressing both PM and NOx emissions set forth in the regulations. In some cases the engines and equipment necessary to meet stringent standards in these regulations will not come to market until 2014. (EDWARD) (GAINES) (ECCO2) (PPC) (PBL)(RUNNER) (MALDONADO2) (MCCULLOUGH) (SR) (VC&M) (MILLER) (MARGETT)
6. **Comment:** The regulation of NOx emissions has been added to the rule. The addition of NOx significantly alters the kind of technology needed for companies like ours to be in compliance with the proposed regulation. Currently, there is no diesel engine that is capable of addressing both the PM and NOx emissions. (FCICI2) (SKANSKA)
7. **Comment:** The ARB proposed regulation will impose an impossible burden on people like us that can't afford this big of an expenditure (on technology that isn't even proven) over such a short span of time. (COX)

Agency Response: Several comments (PBL, ECHAMBER, and LACN) state that the engines available today do not address both PM and NOx. While it is true that the Tier 2 and 3 engines available today do not have as low PM and NOx emissions as the final Tier 4 engines that will become available in the 2014-

2015 timeframe for most horsepower groups, as described in Table V-3 and illustrated in Figure V-2 in the Technical Support Document, today's Tier 2 and 3 engines are dramatically cleaner than the earlier Tier 0 and Tier 1 engines.

Thus, moving a fleet from being made up primarily of Tier 0 and Tier 1 engines to having primarily Tier 2 and 3 engines will achieve significant PM and NOx emission reductions. In addition, as we expect Tier 2 and Tier 3 engines will be part of the final solution for many fleets (i.e., part of the fleet's composition after the final fleet average target date), it is not necessary for fleet owners to wait until Tier 4 engines are available to begin complying with the regulation and making progress.

Also, the combination of newer engines and the installation of VDECS will lower both NOx and PM compared with older, dirtier engines. The Board adopted the regulation with the view that VDECS will be a part of the long-term solution for fleets complying with the in-use performance standards. ARB estimates that in 2020 after complying with the regulation, approximately 40 percent of the statewide fleet will consist of vehicles with Tier 2 and Tier 3 engines. Most of these vehicles will be retrofit with VDECS, and this combination of non-Tier 4 engines and retrofits will likely be the lowest cost compliance option for most fleets. However, the fleet owner has flexibility in how they choose to comply with the regulation; with planning, the fleet owner can minimize their associated cost. Each fleet owner should analyze its fleet composition and business needs while choosing its compliance path.

Please see responses in section III-A-6k)v) of this FSOR for a discussion of the double control of the same vehicle issue raised in the SUKUT4 comment.

Please see also the response in section III-A-6)c)i)3)a) of this FSOR for a discussion of why the regulation cannot be delayed to wait for the availability of Tier 4 engines.

Please see the response in section III-A-6)c)xi) of this FSOR for a discussion of when and why NOx requirements were added to the regulation.

2)e) Need More NOx Technologies

- 1. Comment:** The regulation of NOx emissions has been added to the rule which significantly alters the kind of technology needed for companies to be in compliance. Although there are two NOx control technologies that were recently certified, these technologies are very limited in terms of which engines they apply to and the percent control that they achieve. For the vast majority of engines, there are no certified retrofit NOx control technologies, and, hence, to comply with the NOx standards, the only option is engine replacement. If ARB could postpone the NOx provisions until NOx retrofit control technologies become available, the cost would be

significantly reduced. To achieve cost-effective NOx retrofit technologies will require some time and effort, and ARB needs to allow this process to occur, just as ARB has promoted PM retrofit control technology development since 2000. (The NOx control provisions of the ORD rule were added in December 2006.) One of the main reasons that off-road NOx retrofit technology has lagged behind is there is no clear market for the technology, and there is insufficient data about the number and type of off-road engines where NOx retrofit technology is needed. To obtain this data, ARB needs to do a detailed inventory of off-road engines. After the inventory is completed, NOx control providers will have the data they need to invest in NOx control technology development. Without this data, cost-effective NOx controls will not be developed. (MCQUEEN1) (MCQUEEN2)

Agency Response: We agree that NOx exhaust retrofits could be a more cost-effective way to comply with the NOx requirements of the regulation. As described further below, currently, there are two NOx devices verified for off-road use:

- Engine Control System AZ Purimuffler/Purifier diesel oxidation catalyst/emulsified diesel fuel system, which is a Level 2 system for PM and which is verified to reduce NOx 20 percent; and
- Extengine selective catalytic reduction system, which is a Level 1 system for PM and which is verified to reduce NOx 80 percent.
- Although these verifications are relatively limited, ARB staff anticipates that the recently approved regulation will stimulate the exhaust retrofit market, and more NOx exhaust retrofits should become available in the near future.

Additionally, ARB expects the Off-road Diesel Retrofit Showcase Program to yield many new verified products for off-road use. There are sixteen manufacturers with thirty products in the Showcase Program, and all have committed to pursue verification. The goal of the Showcase Program is to demonstrate the viability of diesel emission control devices in a variety of off-road environments as well as to obtain new emission control systems that will be ARB verified. This project provides an opportunity for manufacturers of diesel emission control technologies to participate with fleet owners in retrofitting their engines with a diesel emission control device to reduce diesel particulate matter or diesel PM plus NOx. Participation in the Showcase Program is open to private construction companies, public agencies, local governments, and other owners of off-road diesel construction equipment in the SCAQMD. Currently, there are eight devices that reduce NOx as well as PM participating in the Showcase Program.

2)f) New Technology Possibly Not Reliable

1. **Comment:** The reality of it is that I upgraded my backhoe due to the decreased emissions from the new ones. I have been aware of this

upcoming regulation for a year or more now, and have also checked into the feasibility of putting particulate filters on the other equipment. I have not been able to get much of a response from the manufacturers of said filters. I find it hard to comprehend the difficulty of having this accomplished, which seems to be a rather technically involved process, when I cannot even get information on the systems. From what I have been able to gather from Internet sources, it seems these filters are going to be problematic on equipment that does not run at constant RPMs. If retrofitting engines is mandatory then engines that are designed to fit the application should be available. (CLKCS)

2. **Comment:** The time is not right to try unproven technology. (STEICO1)
3. **Comment:** As a small builder I cannot afford to replace all my engines with unproven system's that are still in the design stages. (AFZAL)
4. **Comment:** We also recommend that regulations only be established after retrofit and new-engine technology has been proven, tested and certified to meet (or exceed) the regulatory specifications. (BCL)
5. **Comment:** ARB should replace the requirement for prescribed 20 percent VDECS solutions (solutions that are not currently available in an engineered, proven, warranted package, regardless of what CARB staff wants to believe). (SHAWM1)
6. **Comment:** We are concerned with the reliance on prospective and untested technological solutions. (GC2)

Agency Response: We do not agree that the new technologies available are not proven. ARB's verification program is structured to evaluate and assure the emission and durability performance of a diesel retrofit system. Durability testing includes actual field tests on operating equipment, including demonstrations to ensure that the device:

- Achieves the purported emission reductions over time;
- Does not cause damage to the engine or an engine malfunction;
- Does not hinder or detract from the vehicle's or equipment's ability to perform its normal functions; and
- Is durable, that is, physically intact and well mounted with no signs of damage, leakage or other visibly detectable problems.

To ensure the long-term performance of a verified system, after a VDECS has been through the verification process, ARB requires field testing additional in-use compliance testing data on actual operating equipment to ensure long-term emission performance and durability. If problems surface at any time during or after the verification process, ARB can deverify a VDECS.

Retrofit technology is presently, and increasingly, available. As described in Chapter VIII of the Technical Support Document, the Europeans have taken the lead in requiring DPF retrofits of construction vehicles. European interest in diesel retrofits was spurred in the early 1990s when large-scale tunnel projects in Switzerland, Austria, and Germany using heavy diesel equipment were planned. The Europeans formed the VERT project to find technologies that could allow heavy diesel equipment to be used in confined spaces, and have subsequently began to require diesel retrofits widely on construction projects. Approximately 35,000 DPFs have been installed on all varieties of construction vehicles used on large construction projects in Switzerland and in confined spaces in Germany. The European experience is slowly being duplicated in the U.S. through a variety of projects and rules. To date, the largest construction retrofit projects have been on the East Coast. In Boston (on the Central Artery/tunnel Project) and in New Haven (on the Interstate 95 New Haven Harbor Crossing Corridor) 200 to 300 pieces of construction vehicles have been retrofitted with diesel oxidation catalysts (DOCs). DOCs will be retrofitted on approximately 290 pieces of construction equipment in Chicago on the Dan Ryan Expressway. For the demolition and remediation of the World Trade Center site, low-sulfur diesel fuel was used, and eight pieces of construction equipment were retrofitted with DOCs or DPFs. For the Croton project, a North Bronx, New York, drinking water construction project that began in 2005 and is continuing, over 25 pieces of construction equipment including loaders, excavators, dozers, drill rigs, and off-road trucks were retrofit with DPFs. The filters were from four different retrofit manufacturers and included actively and passively regenerated models. In 2006, twelve construction vehicles including a compactor, excavator, and other off-road vehicles were retrofit with diesel particulate filters during construction of a new runway at the Los Angeles International Airport.

Even though a VDECS may be verified for a particular engine, under subsection (e)(8) of the regulation, a fleet owner may request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because it cannot be safely installed or operated in a particular vehicle application. Therefore if a fleet is concerned about the reliability of a VDECS in a certain application, this provision would allow them to apply to ARB for an exemption from the retrofit requirements.

Additionally, new vehicles are being produced today with certified Tier 2, Tier 3 and Interim Tier 4 engines; these engines and vehicles are not in the development stages. Many of these engines are more fuel efficient, and can even increase the productivity of a fleet. We believe the incorporation of these new engines into the off-road fleet is critical to meeting the requirements of the regulation to reduce PM and NOx emissions statewide.

See also the response in section III-A-2)a)iv) in this chapter of the FSOR for further discussion of why we believe VDECS are adequately proven.

2)g) Availability of Used Vehicles

1. **Comment:** There will be no market for used equipment - CARB staff has assumed that many contractors will be able to comply by purchasing used Tier 2 and Tier 3 equipment at industry auctions. It is highly unlikely that any contractor will dispose of a Tier 2 or Tier 3 compliant machine. In particular because the Tier 4 replacement machines will not be available until very late in the compliance schedule and Tier 2 and Tier 3 machines will have to make up the bulk of any compliant fleet. (CIAQC7)
2. **Comment:** One of the components that really needs to be addressed is the availability of used vehicles in the marketplace. They have not done an analytical balancing in order to figure out if there's going to be enough Tier 2 and Tier 3 engines really available in the market for future purchase. (M3CON)
3. **Comment:** New equipment was underestimated by your staff. They assumed there'd be a used equipment market. There isn't going to be. There isn't now. They're going to have to buy new. (CBCC3)
4. **Comment:** They just had a huge auction up in Riverside. Almost no equipment was over Tier 2. Used equipment is not an option. It won't be because nobody's going to be giving up any of the good equipment. We have taken advantage of the repower money. (H-CAT)
5. **Comment:** The Associated General Contractors (AGC) expects to demonstrate that engine and retrofit manufacturers, the used-equipment market, and suppliers and installers could not meet the demand that the rule would create for equipment essential to the construction industry. (PILCONIS) (AGCA3)
6. **Comment:** How many new vehicles must be introduced into the fleet to achieve the proposed standards, versus the assumed reliance on used vehicle purchases by the ARB staff. It is also important to note that many firms, particularly smaller businesses, rely on the used equipment market rather than purchasing new. Yet under the regulation the market for used equipment within would shrink substantially; only newer models will meet the air quality requirements and current owners would retain Tier 2 and 3 models to meet the various standards. (CIAQC1)
7. **Comment:** We believe CARB greatly overestimates what the market for Tier 2 and higher equipment will be during the life of this regulation. The reality is that most companies will buy new equipment or use CARB's exemption that allows companies to do nothing if a repower or used piece of equipment is not available. (TA)

- 8. Comment:** ARB has overestimated the amount of Tier 2 and Tier 3 equipment on the used equipment AGC does not find it credible to suggest that the current owners of such equipment will readily dispose of it, as Tier 4 replacement engines/equipment will not be available until very late in the compliance schedule. Until then, Tier 2 and Tier 3 machines will have to make up the bulk of any compliant fleet. This mistake has compounded the effect of ARB's immediately preceding mistake, and further slanted its economic analysis. Few contractors will have the option of purchasing used Tier 2 and Tier 3 equipment at industry auctions. AGC strongly believes that engine and retrofit manufacturers, the used-equipment market, and suppliers and installers will not be able to meet the demand that the rule would create for equipment essential to the construction industry. As a threshold matter, equipment manufacturers have indicated that the demand created by ARB's regulation would exceed the availability of the required retrofit devices and replacement engines and machines. (AGCA3)
- 9. Comment:** The Staff analysis assumes that most of the equipment required to meet the accelerated fleet turnover rate will come from the used equipment market. However, the analysis shows that the statewide fleet will have to add 3.4% more vehicles for 2010 to 2012, 3.0% for 2013 to 2020 and 2.0% from 2021 to 2030. For the initial period, this represents a 50% increase in the turnover rate in the Staff's emission inventory model, and a near doubling of the historic empirical turnover rate. The Staff has not demonstrated where the used Tier 3 and 4 equipment required to comply with the accelerated rule will come from—its analysis relies on the total used market that is dominated for Tier 0 and 1 equipment. Given that this rule will require significant new equipment purchases, based on EMA data, the new equipment market will have to expand by two thirds by 2010 to meet the increased demand. (CIAQC6) (AGCA3)
- 10. Comment:** ARB staff's assumed reliance on used vehicle purchases is unrepresented and unsupported. How many new vehicles must be introduced into the fleet to achieve the proposed standards, versus the assumed reliance on used vehicle purchases by the ARB Staff. (CIAQC6) (AGCA3)
- 11. Comment:** The used equipment market was overestimated. Virtually no compliant equipment will enter the used market in the future as fleet owners chase the emission reduction curve. (SCCA3)
- 12. Comment:** Where will affordable and viable equipment come from? (DMCI)

Agency Response: We believe there will be sufficient numbers of used vehicles available to fleets to comply with the regulation. Although we acknowledge that firms subject to the regulation may tend to hold their Tier 2 and 3 vehicles, the used vehicle market is a national and indeed international market, so California fleets may purchase Tier 2 and 3 used vehicles from outside the State. Also, in the early years of regulatory implementation, large fleets may acquire used vehicles from small and medium fleets. Small fleets are not subject to the regulation's requirements until 2015 and even then are exempt from the NOx requirements; medium fleets are not subject to the regulation's requirements until 2013.

As described further in Attachment 3 to the Third Notice of Public Availability of Modified Text and Availability of Additional Documents, although there were some errors in the used equipment analysis in the Technical Support Document, staff redid the analysis and the new analysis supports the conclusions of the original analysis. The new analysis shows nearly the same total number of used vehicles and an even higher proportion of Tier 2 or higher vehicles than the Technical Support Document. The new analysis showed 72,594 used vehicles available for sale, 32,587 of which were likely to be Tier 2 or higher (model year 2003 or newer). The number of vehicles that were likely Tier 2 or better was actually 9 percent higher than the previous figures stated in the Technical Support Document.

We believe, as indicated by the 9 percent increase in 2003 or newer equipment over the past year that in the years to come even more Tier 2 and 3 used vehicles will become available for purchase by fleets to comply with the regulation. This will occur as Tier 0 and 1 vehicle naturally cycle out of service.

The turnover requirements imposed by the regulation will require a maximum of 10 percent (eight percent in the initial years) of a fleet's statewide horsepower to turn over each year. The baseline natural rate of turnover of the statewide fleet is about 5 percent per year. Thus, the regulation will at most require 5 percent more turnover per year than normal. The regulation affects about 180,000 off-road vehicles. Therefore, the maximum annual (incremental) increase in demand for Tier 2 or better vehicles and engines in California will be an additional 5 percent, or about 9,000 per year. This demand will be satisfied through a combination of engine repowers, purchase of new vehicles, purchase of used vehicles, and installation of NOx retrofits. Even if all the turnover demand were satisfied through used vehicle purchases, though, as noted above, there are over 32,000 used Tier 2 or higher vehicles available for sale at any time, which will be more than sufficient to satisfy the demand.

Finally, if a fleet does face unavailability of a specific used vehicle it needs, the regulation contains provisions to protect that fleet from being penalized. The regulation's specialty vehicle provisions in section 2449.1(a)(2)(A)4. Provided

that if there is no used vehicle available to replace a vehicle and a repower is not available, the vehicle is exempted from the turnover requirements.

2)g)i) Availability of Used Large Horsepower Vehicles

13. Comment: There are few, if any, high horsepower used vehicles available for replacement. (MCQUEEN3)

14. Comment: The availability of large, high horsepower equipment is particularly important for the mining industry. (CALCIMA)

Agency Response: We acknowledge that cleaner, used vehicles to replace certain vehicle types may be difficult to obtain. This may be a particular concern for high horsepower vehicles. However, the regulation contains provisions to protect fleets that encounter a lack of available replacement vehicles from being penalized. First, the regulation contains fleet average provisions so that fleets may choose to meet the fleet average targets by keeping some older, high horsepower vehicles but offsetting their emissions by controlling their other vehicles. Second, the regulation's BACT provisions allow fleets some flexibility in choosing which vehicles they retrofit or replace first, and so may allow fleets to keep some older, high horsepower vehicles until more suitable replacement vehicles are available. Finally, and perhaps most importantly, the regulation contains specialty vehicle provisions so that a fleet is never forced to turn over a vehicle if (1) no repower is available for the vehicle, and (2) a used vehicle with a cleaner engine is not available to serve a function and perform the work equivalent to that of the specialty vehicle. Overall, staff believes these provisions in the regulation are adequate to allow fleets that encounter a lack of replacement vehicles to comply and avoid being penalized. .

For additional information, refer to the responses to comments III-A-6)a)vi)2) and III-A-6)k)vii)8) in Chapter III-A-6 of this FSOR.

2)h) Effect on Industries that Support Used Vehicles

1. Comment: All the after market parts providers will be out. The retailers of used machines will be gone and their advertisers. The mechanics will be gone because most will have to rely on the dealers and they'll be backlogged for years. The support system on these contractor's fleets, the suppliers, etc. will surely go down because there will be less machines and less contractors to support. Support systems are fuel distributors, the truckers that haul the fuel, the parts people and mechanics who keep it running. UPS, that delivers used parts, won't be doing it. The people who build engines for these older machines and the people who make their parts will also be affected. It will be a massive trickle down effect. (CBC)

Agency Response: We disagree. The commenter assumes that the regulation will force the wholesale purchase of new vehicles throughout the industry,

thereby undercutting the purchase and use of used vehicles and the business that rely upon them. This is just simply not the case. The regulation not only allows the use of used vehicles, but is structured to allow fleets to comply by retiring Tier 0 vehicles and purchasing cleaner, used vehicles. As discussed in the response to comment III-A-2c)i) in Chapter III-A-2 of this FSOR, ARB staff estimates that there will be little or no additional demand for new vehicles resulting from the regulation, but there will be an increase in demand for relatively new, used vehicles. The inclusion of GSE testing in the verification procedure is discussed further in the response to comment III-A-2a)xx) in Chapter III-A-2 of this FSOR.

In addition, the regulation phases in gradually, never requiring more than 10 percent of a fleet's horsepower to be turned over in any year. Also, the regulation completely exempts small fleets until 2015. Therefore, we estimate that many fleets will continue to operate older vehicles for many years to come, and will continue to rely on mechanics and other support systems to keep them operating.

3. Cost and Cost-Effectiveness

3)a) Affordability

3)a)i) Affordability for Fleets Owners

1. **Comment:** ARB cannot rewrite how we run our business unless they provide a way for us to do it. For me to replace a four hundred thousand dollar piece of equipment that I may use 400 hours a year cannot be justified unless ARB pays me to do it. The money has to come from somewhere to replace the equipment in the regulation. We have good years, and we try to save when there are bad years. That is just good sense. We cannot go and buy equipment without being able to pay for it. If we do, we go out of business. (DMCI)
2. **Comment:** I have invested in quality equipment and effective maintenance to make it last for a long time. ARB's regulations prematurely shorten its life span. I cannot afford to replace a fleet of equipment that has taken me twenty years to build up. (STOWE1)
3. **Comment:** We have worked very hard over the past 20 years to accumulate various pieces of equipment so that we can make a living, pay taxes and donate to our community. These pieces of equipment are older but very well maintained by my husband and they are paid for. The ARB regulation will impose an impossible burden on people like us that can't afford this big of an expenditure (on technology that isn't even proven) over such a short span of time. (COX)

- 4. Comment:** We are concerned about our ability to pay for the compliance costs. (RTC)
- 5. Comment:** The effects of this regulation will be catastrophic to my business at a time when increased competition from private sector companies moving into public works has already caused me to downsize space and employees. The regulation will severely hurt many construction businesses when we are already struggling to keep our companies moving forward and our employees employed. (LTE)
- 6. Comment:** This regulation will be such a financial burden on my business that I will have to close my doors and go out of business. Please consider that I fill a demand for limited access grading and excavations. Many people, contractors, landscapers, homeowners and many others, rely on my services. But with the cost of fuel, taxes, equipment maintenance and the other burdens placed on my business, mostly by poorly managed government, this regulation would be a final blow to my livelihood. (EVANS2)
- 7. Comment:** The regulation will put me out of business. (HFEC) (VPC) (MAY)
- 8. Comment:** The regulation is so costly that it will most likely put our medium size construction company out of business. The financial analysis that the CARB is using is very flawed. Our company historically runs equipment that is five to twenty five years old. This equipment is kept in very good working equipment. We cannot justify economically the huge expense of either retrofitting our existing equipment or purchasing new. (ELKINS)
- 9. Comment:** The regulation will have a devastating effect on our company, which forces us to replace the majority of our equipment in an unreasonable time-frame. (SKANSKA)
- 10. Comment:** I am concerned with having clean air for myself as well as future generations, but in complying with the new set forth regulations would put my career as well as my personal home in jeopardy. With the new regulation my company will be forced to close its doors, and I will lose my livelihood. (OE3)
- 11. Comment:** The regulation will put me out of business if implemented. I'm all for clean air but to force a regulation retroactive to existing equipment would cause extreme hardship on my business and family. (CARRUTHERS)

12. Comment: The regulation is severely flawed in not only its conception, but also in the implementation process. I have over 60 employees that are currently operating equipment in the Southern California area. If this program is implemented, especially during the current severe slowdown; I will be forced to close my doors, after over 30 years in the business. There is absolutely no way that I can implement this program, and survive in this economy. (MADGWIC)

13. Comment: The regulation will have a profoundly negative impact on our ability to stay in business. We have a 50% chance of survival. (WPC2)

14. Comment: We want a regulation that doesn't risk putting us out of business. (MCCLAUGHLIN)

15. Comment: If the regulation stays as written, and we cannot pass on the high cost of this rule, then we will borrow ourselves into bankruptcy. (CAMARILLO8)

16. Comment: The ARB wants to put us in debt or take us out of business. That is not right. (RRPI2)

17. Comment: While many of California's larger construction companies have already begun the process of repowering or retrofitting their fleets in anticipation of these regulations, our company will be severely hampered by the costs of repowering or retrofitting equipment which is the major asset of our business. Additionally, our company simply does not have the resources or access to capital to do the repowering or retrofitting of our engines. Even though we have worked 11 years in building our company to what it is today, we may be forced out of business. (PPC)

18. Comment: With this regulation, our company will not survive after 42 years of business in San Diego. (THARP)

19. Comment: Our company cannot afford to replace 10% of our equipment horsepower each year! There is only so much money to be spent and it cannot all be spent on diesel powered equipment. (HBE)

20. Comment: While we applaud California's leadership in environmental quality, the accelerated schedule for original requirements and the additional NOx emission requirements only recently set forth by CARB for off-road in-use diesel equipment will have an over-reaching detrimental effect on our business. The regulation may cause our local contractors to close. (MC)

21. Comment: We just can't afford the huge capital outlay in the compressed time schedule that's required even if the technology and the solutions

were available. I don't think there's any question in my mind that our company if we survive this will be much smaller at the end of the day. I'm not really sure that we're going to survive it. (P&S)

22. Comment: This regulation, if it holds to the current timetable, will force a high percentage of contractors to close their doors or move out of state. The fact we have to face though is that replacing the older machines takes capital. Depending on the time of year, or current job situation the money for capital purchases may not be there. We have to be very careful with our resources to be able to stay in business. There is no way that the cost can be absorbed by some of these contractor firms. (TERRELL1)

23. Comment: The regulation will result in devastation or closure of many contractors, many of whom are minorities. (ECA)

24. Comment: Contractors that base their business decisions on fleet turn over will be forced to move up that turnover schedule which will drive up costs significantly and for some, drive them out of business as we are talking about replacing assets that can have costs from \$50,000.00 to \$500,000.00 each or more. I realize that the EPA has set goals to be achieved with in a set time frame or there are financial consequences to our federal funding, but bankrupting local business and municipalities for the sake of federal funding is much like cutting off your nose to spite your face. This regulation will drive contractors out of business. (MCDONALD)

25. Comment: I'm confident that this quick fix will come at such a cost to Californians that the economy will take a significant blow. Thousands of owner/operators will be forced out of or into reduced business due to the astronomical costs associated with the replacement or retrofit programs. (MCNALLY)

26. Comment: I believe the manufactures and contractors are doing everything they can but are limited to the latest technology. The standards being set by this regulation will be expensive for everyone from the contractor to the taxpayer, possibly forcing some businesses to shut down completely. (NBC)

27. Comment: As a small contractor and business owner in California, I feel that this regulation will, with out a doubt, put many companies out of business. If your intention is to gain air quality by means of reducing the number of businesses in California, then CARB is definitely on the right track. (R&J)

28. Comment: Construction is a low-margin business and many contractors will be forced to reduce their fleets and in some cases go completely out

of business in order to be in compliance with these regulations.
(MARGETT)

29. Comment: The regulations will wipe out most of my potential employers along with many other California businesses. (SIEVERT1)

30. Comment: We understand and agree that steps need to be taken to reduce emissions in California and the rest of the world, but these regulations could put Coastal Earthmovers, Inc. out of business, as well as many other California contractors. (CEI3)

31. Comment: I think your new rules for diesel construction equipment are too harsh. It will run everyone out of California (contractors and workers). (BING)

32. Comment: One of the unintended consequences of this regulation will be to put out of business many heavy construction equipment owners both large and small. (SHAWM1)

33. Comment: This regulation cannot be done without laying off employees and could even result in our company leaving the state or going out of business entirely. (SCOTTR)

34. Comment: For the bulk of the industry the regulation can only lead to a decline in competition for construction jobs and will undoubtedly kill off many businesses that can not afford to upgrade their fleet. (GROVES)

35. Comment: This regulation will cause a burden on me, my son, and our families. Construction work is slow enough right now due to the housing market and the proposed new regulations could bring construction to a near standstill. (HYLAND1)

36. Comment: It is really the cost that we're looking at. When the time comes we are going to find a way to do it but some people may have to close their doors. (AYALA)

37. Comment: To meet CARB's objectives in such a short time-frame will drive many contractors out of business entirely. (CRS)

38. Comment: Since the construction is a low-margin business, many contractors will be forced to reduce their fleets and in some cases, go completely out of business in order to be in compliance with the regulations. (MALDONADO2) (MCCULLOUGH)

- 39. Comment:** CARB has presented information that concludes that California contractors can afford to comply with this regulation. This conclusion is wrong. (RJB1)
- 40. Comment:** I am very concerned that your regulation will drive people out of business. (EUCA)
- 41. Comment:** The contractors do not have the financial resources to acquire that many new pieces in the time available. (CIAQC7)
- 42. Comment:** The program will put contractors out of business (or at least severely reduce their ability to perform). (DCCI)
- 43. Comment:** We have serious concerns about the regulation regarding off-road diesel engines. This regulation will have significant financial impacts on all contractors that own equipment. The cost to re-power equipment is very significant; most will not be able to afford the costs associated. (OSE) (MSSE)
- 44. Comment:** I would agree with those heavy equipment owners in my industry that the onerous nature of the regulation will force many business owners out of business. (NDA)
- 45. Comment:** The regulation will drive contractors out of business early. (NNC)
- 46. Comment:** The regulation will put many out of business. (CAMARILLO5)
- 47. Comment:** Our company is more than willing to cooperate with the emission reduction goals set forth by the regulation, however those goals are not best attained by contractor's going out of business because they cannot afford to comply. (AAWC)
- 48. Comment:** ARB's regulation could cause over two thirds of the privately owned construction companies in California to shut down or at least downsize from a large fleet to a small fleet. (CIAQC2)
- 49. Comment:** On an annual basis we do about \$3 million a year in business. Our industry does average about 5 percent a year. On a 5 percent profit margin, we make about \$150,000 a year on a good year. It's going to cost us roughly \$170,000 to \$225,000 a year to comply with the regulation. So when you look at our profit margin, we're going to the bank to borrow money to stay in business. (CLOUD)
- 50. Comment:** [Erik White] mentioned that we could afford \$400,000 a year, which would be manageable. But I tried to tell ARB staff that all that million

dollars that we make after tax per year is already obligated to purchasing late model high tier equipment. You have to have after-tax money to make principle and interest payments. All of that after-tax money is going to purchase right now 16 late model high tier machines. Just because this regulation goes into effect, that doesn't mean we have another \$400,000 to comply with this regulation. There isn't one member of ARB staff that I know of that has ever been in business. None of them have ever owned a diesel machine. According to ARB staff members, it will cost our company about \$2 million each year for the first three to five years to comply. \$2 million amounts to double our annual tax profit, our annual after-tax profit. There is no regard for payment of our current debt in which we are purchasing 16 late model high tier machines. (DER7)

51. Comment: Our company will be unable to fund the capital requirements dictated by the regulation. We estimate that it will cost our firm more than \$5 million to achieve compliance through 2020. Our annual work volume – not to be confused with profit – is just under \$5 million. It is our opinion that the financial impacts on RJ Berry and many other construction firms will be extreme. (RJB2)

52. Comment: This regulation would render our company almost worthless if your program is implemented as is. The cost of retrofitting and/or replacing the motors or equipment would be devastating to our operation. The replacement cost of our fleet would be over 5 million dollars. We don't generate enough revenue to warrant this replacement over a 10 year period. As far as the retrofit, this sounds like a temporary fix that does not have enough history to be proven out as worth the install. (KLINE)

53. Comment: To replace my small fleet might run 3 million dollars. If I had 3 million, I would surely hang it up. (CBC)

54. Comment: The bottom line is, for me to repower -- which I started in '99 and took a hundred pieces of equipment and now have 10 percent Tier 0 and 90 percent Tier 1 -- for me to repower and get to 2010 its \$2.8 million a year starting next year. Its \$3.9 million the following year and \$4.7 million the following year. If I only make 5 percent of my best year and do \$50 million, I'm making two and a half million dollars a year and I'm going to the bank to borrow more money so I can keep operating. All we're asking is show us a way we can do it financially so we're here to do it. (ERRECA)

55. Comment: It would cost my company over \$100,000 to retrofit my equipment. My company could not survive this expense. (CARRI)

56. Comment: Even with the amount of dollars that we dedicated to improving our fleet, we still cannot meet the PM and NOx target numbers

indicated on the CARB Fleet Worksheet. If ECCO eliminated the remaining Tier 0 engines from the fleet, the cost would exceed \$154 million, using our average replacement cost of \$521,216.81 per piece of equipment. Even if we eliminated all of these units, we still do not meet the PM and NOx target numbers required by the regulation. The following chart represents the costs that ECCO will be faced with in meeting these annual requirements on a fleet consisting of 694 machines with a combined total of 191,047 horsepower:

08% NOx Turnover	15,284 Horsepower	CARB's Estimate of \$280 per Horsepower	\$4,279,520
10% NOx Turnover	19,105 Horsepower	CARB's Estimate of \$280 per Horsepower	\$5,349,400
20% PM Retrofit	38,209 Horsepower	CARB's Estimate of \$100 per Horsepower	\$3,820,940

Depending on whether ECCO is using the 8% or 10% rule, the cost will be in excess of \$8 million per year. This does not include any of the recordkeeping and equipment labeling expenses that are required as part of this regulation. Additionally, this cost does not include any upgrading or purchasing of new equipment into the fleet. (ECCO5)

57. Comment: We remain extremely concerned about the economic impact of the regulation on our ability to survive as a company. We understand that this is a critical rulemaking and hope that you will understand and address the very large economic impacts the regulation will have on businesses such as ours. Based on our latest evaluation, Blue Mountain Minerals will have to spend millions of dollars (over \$500 per horsepower, or about three times as much as the highest Air Resources Board model estimate) to comply with the regulation. In order to generate the necessary funds to undertake this investment, we will be required to increase our prices substantially (this increase will be taxed by Federal and State agencies). Financing alternatives do not appear to be very helpful. The company's balance sheet, the cycle of the banking sector (are they interested in new loans or restricting credit), and the overall economic conditions are the major determinants of the debt capacity of a small company. Assuming that the company could borrow the necessary funds through equipment lines of credit with five years maturity at 10% per year, the financing charges (principal plus interest) would be nearly as much as the outright purchases. Therefore it appears that a similar price increase would be required under the financing alternative. At this moment in time, it is difficult for us to quantify the response of our customers to the price increase necessary to comply with the regulation. We are extremely concerned that an increase of such magnitude would substantially reduce our sales volume, requiring therefore even greater price increases, which would further reduce volume and require higher prices, starting a

downward spiral. This downward spiral would severely impact our business. (BMM1)

58. Comment: As a heavy construction contractor, we operate well in excess of \$100 million in off-road diesel equipment; a “Large Fleet” by your standards. We are required to bring numerous and substantial pieces of off-road equipment (>25 HP and used >100 Hours per year) into the state as we perform large public works contracts. The value of heavy loaders, cranes, directional drills, oilers and other equipment used in our operations range from \$500,000 to well in excess of \$1,000,000 each. Substantial investment in capital equipment needs to be well maintained to insure it lasts a long time. The regulation as promulgated will require a substantial sale of older, fully capable equipment and costly reinvestment in equipment that doesn’t even exist today. Repowering other custom equipment used in our operations is either cost prohibitive or not currently manufactured. (MC)

Agency Response: As stated in section A, Chapter XI of the Technical Support Document, we recognize that compliance with the regulation may be financially challenging for owners of regulated vehicles. Many fleets may have to change how they allocate capital resources, and they may need to borrow money to purchase retrofits and repowers, or to upgrade their vehicles.

Overall, we expect that most affected businesses will be able to absorb the costs of the regulation with no significant adverse impacts on their profitability. This finding is based on the staff’s analysis of the estimated change in “return on owner’s equity” (ROE) for fleets within each industry type affected by the regulation, which is described on pages 183 through 185 in Chapter XI of the Technical Support Document. The ROE analysis concluded that between 60 and 80 percent of fleets could absorb the cost of the regulation without incurring more than a 10 percent change in ROE. The impact the regulation will have on the remaining 20 to 40 percent will depend on the ability of those fleets to raise their revenues (i.e., pass costs onto customers).

In addition to the Carl Moyer Program, to minimize the financial strain of compliance, staff is consulting with other state agencies such as the Pollution Control Financing Authority in the State Treasurer’s Office and private lenders to look for ways to leverage existing public programs and funding in the private sector, through potential programs such as government loan guarantees, interest rate buy down programs, etc. It is hoped that these efforts could make compliance with the regulation more affordable and access to capital more widely available. Please see the response in section 6)e)x) of Chapter III-A-6 of this FSOR for a further discussion on potential funding programs.

The regulation, as adopted by the Board, contains many provisions aimed at providing fleets with compliance flexibility. It includes options such as NOx or PM

retrofitting and repowering that can help fleets avoid the costs of replacing vehicles. In addition, it gives credit for early repowers, turnovers and retrofits to reward early actions and help fleets spread out their compliance costs and avoid spikes in compliance costs in early years. The early credit provisions include:

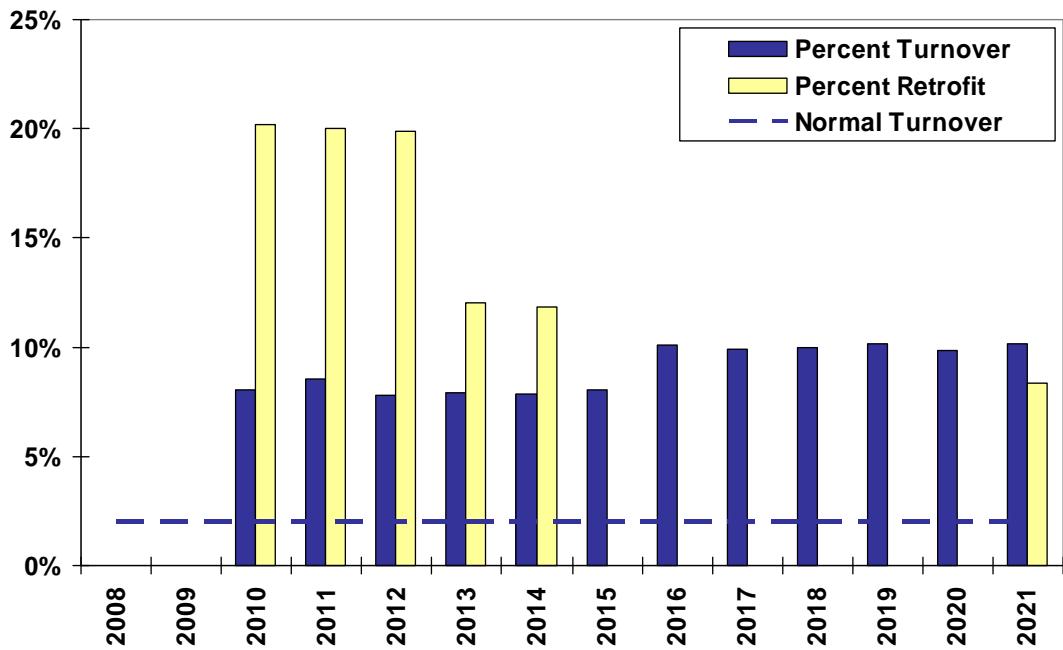
Double credit for any PM exhaust retrofits installed before March 1, 2009; Single credit for any repower (to at least a Tier 1 engine) that was performed at any time before March 1, 2009, as long as that repowered vehicle is still in operation in the fleet; and credit for retirement/replacement of Tier 0 vehicles in excess of 8 percent per year on average between March 1, 2006 and March 1, 2009.

In addition, the Board directed staff to add section 2449.2(a)(2)(A)1.b., which allows a fleet to retire Tier 0 vehicles from their fleet in lieu of retrofitting vehicles. If a fleet is reducing its total horsepower from one year to the next, they are allowed to count the Tier 0 vehicles retired towards their PM BACT requirements. This is expected to alleviate the financial strain on fleets in hard economic years by allowing them to reduce their horsepower instead of paying for exhaust retrofits.

Because a fleet has numerous options for complying with the regulation, the costs of compliance for every fleet will vary. In addition, early credit and financing options are also available to spread costs in the early years for fleets. An example of how a fleet can spread out their compliance costs is outlined in the paragraphs below.

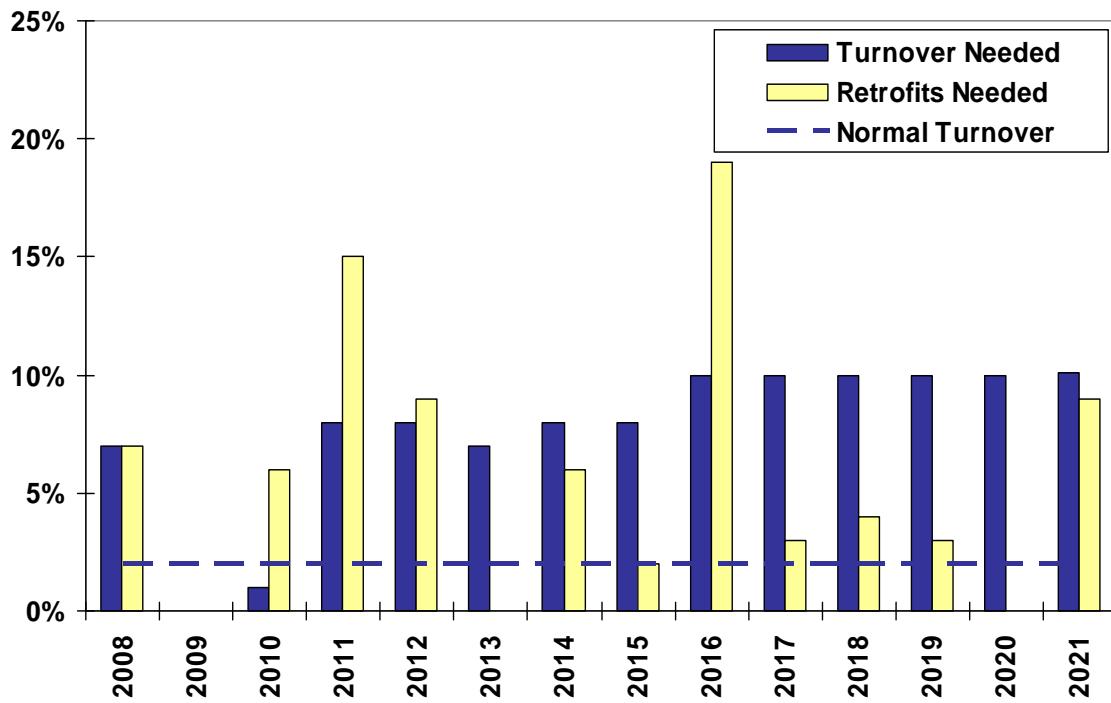
Downs Equipment Rentals testified at the May 25, 2007 Board Hearing that they estimated the regulation's costs to be more than \$2 million per year, and expressed concerns that such costs would be unbearable for their company, which has only \$1 million in annual profits. However, it indicated that costs of \$400,000 per year would be manageable. Figure III-A-3)a)i)-1 below shows the compliance assumptions, which were the basis for the cost estimates that Downs Equipment Rentals shared at the May meeting.

Figure III-A-3)a)i)-1 - Compliance Path Based on Down's Equipment Rentals Original Assumptions



After the May board meeting, the Downs family spent a lot of time with ARB staff and was open in sharing its company's information (which was greatly appreciated by ARB staff). In meeting with them, staff explored a number of potential compliance alternatives, including the use of the early credit provisions in the regulation for both retrofits and repowers. Early credit provides opportunities to utilize financing to bridge the higher cost compliance years to years in which the compliance costs are not so great, and the ability to realize higher rental rates. When these alternative compliance options were utilized, staff found that this same fleet could significantly spread out its costs by utilizing the early credit provisions of the regulation. Using one potential alternative, Downs Equipment could repower 7% of its horsepower to Tier 1 in 2008, and install PM retrofits on these same engines. It could also replace its oldest vehicles with cleaner used vehicles, and install PM retrofits on its dirtier engines first. If these actions were taken, its compliance path would look like the one shown in Figure 3(a)i)-2 below, and its compliance costs would remain below \$400,000 per year that it testified would be manageable.

Figure 3)a)i)-2 - Lower Cost Alternative Compliance Plan for Down's Equipment Rentals



As shown above, the large compliance peaks in early years have been smoothed out when compared to those in Figure 3)a)i)-1. Strategic utilization of financing could further help defray these costs over time. In addition, newer vehicles rent for more than the older vehicles while depreciation also significantly reduces the net annual cost of the replacement vehicles.

Based on our analysis, staff believes that with the use of the alternatives discussed, this company can remain profitable in every year. The net loss in profits on average should be less than 5% of their after tax income. However, at the same time, this fleet will be acquiring newer vehicles which have lower repair costs and can command higher rental rates, and the equity of the company will increase as they add more valuable vehicles to their fleet. While still significant, even in the highest cost year, the regulation's costs (impact on its cash flow) will still be less than what the company indicated it could bear.

In addition to spreading out the costs of the regulation, staff expects that most affected businesses can absorb the costs of the regulation with no significant adverse impacts on their profitability. For additional information on the ability to pass on costs, see the response in section 3)e)vi) in this chapter of this FSOR.

For a more detailed discussion of the compliance costs of the regulation, please see the response in section 3)d)i) of this of this FSOR.

59. Comment: Our Company is in for a long and expensive process that will change the nature of the way we do business and may very well put us

out of business completely. We cannot afford to replace all the equipment needed to meet the fleet emissions average in 2010, so we will need to utilize the method of replacing 10 percent of fleet hp for NOx, and retrofitting 20 percent of fleet hp for PM. (FCICI2)

60. Comment: Our company cannot afford to replace 10 percent of our equipment horsepower each year! There is only so much money to be spent and it cannot all be spent on diesel powered equipment. (HBE)

Agency Response: Commenters FCICI2 and HBE express concern that their companies cannot afford to turn over 10 percent of their fleet per year to meet the regulation's NOx requirements. We would like to clarify that for the first six years of the regulation's fleet average requirements (2010 through 2015), the required turnover under the NOx requirements is 8 percent, not 10 percent. Staff had proposed a 10 percent annual turnover requirement in earlier versions of the regulatory language described at workshops in early 2007. However, we scaled this back to 8 percent at stakeholder request to (1) lessen the financial impact of the regulation and (2) reduce the turnover requirements until after final Tier 4 engines are available for all horsepower groups.

Please see the response immediately above to comments 1 to 58 in this section for a discussion of why we believe the regulation will be affordable.

61. Comment: Faced with uncertainty and escalating costs, a number of our member companies will be forced to close their doors, or to leave the logging industry for other pursuits. California is already experiencing a decline in the "logging infrastructure" necessary to manage our forest lands and assist in the prevention of massive fires. (ACL)

Agency Response: The logging industry will not be affected by the regulation. Logging is a forest operation, as defined in section 2449(c)(26) and therefore is considered to be an agricultural operation, as defined in section 2449(c)(1). Thus, because agricultural operations are exempt from the regulation per section 2449(b), logging is exempt, and logging companies will not be affected by the regulation.

62. Comment: We were among the first to jump in and start repowering our engines to meet the clean air standards in 2001, and ongoing since. After spending hundreds of thousands of dollars of our own and going through the long process of applying for grants, we repowered most of our equipment to the best available engines (Tier 1). Caterpillar could not provide us with Tier 3 engines, and still cannot fully meet the specifications. So after spending millions of dollars of grant money as well as our own expenditures, we are in the position of still not meeting the stringent requirements as proposed. We have been in business in California since 1971, growing from a small one-man operation to

currently employing about 75 people. The regulations now being proposed will force us out of business or out of California. I hope the government of California is prepared for the economic disaster they will be creating. (DINEEN)

63. Comment: Our fleet of off highway diesel engine number about 85 and about 13,500 HP at this time. The average age of our fleet is 6 year old. With the current CARB emission calculator our fleet will not be in compliance in 2010. Even if I dispose of all of my TIER 0 equipment (which is only 6 units (7%)) I still won't be in compliance under the regulation. Please understand the replacement of these 6 units represents an investment from our company of \$600,000 to \$1,000,000 and still be short of the requirements, and we are only in the first year of regulation! (FCI1)

Agency Response: We structured the regulation to give credit for early repowering to reward fleets that took early action to reduce their emissions. Section 2449.1(a)(2)(A)2.a.i. Credit for Early Repowers describes the early credit provisions. Please see the response in section 6)d)i)4) in Chapter III-A-6 of the FSOR for further discussion of how the regulation gives credit for early repowering.

Also, a fleet with an average age of 6 years, such as that described in the FCI1 comment, will meet the NOx fleet average targets and therefore will not be subject to any turnover requirements. Therefore, such a fleet will not face replacement costs. We recognize that such a fleet may not meet the PM fleet average requirements and may need to purchase some VDECS, but this will be much less expensive than replacing entire vehicles.

Even fleets that are relatively clean, such as those described in the DINEEN and FCI1 comments, may not meet the PM fleet average requirements in early years because the PM fleet average targets were set to require fleets to install exhaust retrofits for fleets with any Tier 0 or 1 vehicles. Such fleets will most likely meet the NOx fleet average targets, and so will avoid mandatory turnover. Although many fleets will be on the BACT path for PM (i.e., meeting the PM BACT requirements rather than meeting the PM fleet averages) for the first several years of the regulation, and therefore will need to apply VDECS to 20 percent of their horsepower each year, after these years, the majority of these fleets will meet the fleet average targets.

Please see the response in section 3)b)ii) in this chapter of the FSOR for a discussion of the regulation's impact on the California economy.

3)a)i)1) Loss of Fleet Profits

- 1. Comment:** The Construction Financial Managers Association pegs construction net profit margins at two to five percent. This leaves little

room for error and even less profit for replacing three fourths of the existing 165,000 pieces of construction equipment that CARB says are in the California fleet. (EUCA1)

2. **Comment:** Most companies of our genre will make a 3-5 percent profit on jobs if they are lucky; with this regulation that profit will quickly dissipate and put most of us in the red. There will be a serious backlash to businesses like us. (BECKER)
3. **Comment:** The average profit before tax for contractors is currently less than 5 percent. As a breakdown:
 - Heavy / Highway Contractors (composite of multiple NAICS) 2.6 percent
 - Site Preparation Contractors (NAICS 238910) 3.3 percent
 - Highway, Street and Bridge Construction (NAICS 237310) 3.3 percent
 - Other Heavy and Civil Engineering Construction (NAICS 237990) 3.8 percent

As shown above, there is very little room between profit and loss. Construction contracting is not a generous business. If demands of the new legislation are sudden, thoughtless and otherwise unfair, then bankruptcies are certain to rise (construction is the second riskiest industry currently). (SCI)

4. **Comment:** The cost of the regulation is high relative to the median 2.4 percent profit margin of construction firms. Given that the median represents the point below which half of all firms fall, the cost of the regulation may wipe out profits for a significant percentage of all firms. (AGCA3)
5. **Comment:** On page 10 of the notice of public hearing to consider adoption of proposed regulation for in-use off-road diesel vehicles, it states, "Overall, most affected businesses will be able to absorb or pass on the cost of the proposed regulation with no significant adverse impacts." This analysis is based on ARB staff estimates. We have shown that the regulation in the first year alone will take 58.08 percent of our net profit to meet the PM target. To meet the PM and NOx target without repower credit we'd use up 66.628 percent of our net profit. I would say that that is a significant adverse impact. The DPFs alone have been quoted at over \$1 million to do 20 percent of our fleet horsepower to meet year 2010 PM target. (Camarillo6)
6. **Comment:** The cost of compliance will be between 20 percent and 90 percent of our annual profits. The combined total is in excess of our annual profits for the first five compliance years. (RTC)

- 7. Comment:** We don't make the profits to comply with these needs – ARB's wants, I should say. (TC)
- 8. Comment:** While the cost of the regulation is insignificant against the cost of construction itself, compared with the actual profit a construction company makes, it is very significant. This issue is, of course, highly variable between companies and types of companies, but it can not be understated how much danger a company gets put in when they have to struggle to break even. We ask that it be kept in mind that, while some companies may not have any difficulty with the financial burden this regulation demands, many others stand to be ruined by it. (HCC)

Agency Response: We recognize that the profit margins for many construction firms are small. During development of the regulation, staff utilized the Construction Management Financial Association's (CFMA) 2006 financial survey, and also gathered financial data from volunteer fleets willing to share their fleet and financial data. The profits for the volunteer fleets and quoted on average in the CFMA survey were very similar to those cited by commenter SCI. However, as described further in the responses in section 3)a) in this chapter of this FSOR, we still believe the regulation will be affordable for the majority of fleets.

We also recognize that the costs of compliance with the regulation will be significant for some fleets. As stated in the response in section 3)e)vi) in this chapter of this FSOR, we expect that 20 to 40 percent of fleets will have to pass on some of their compliance costs to remain profitable. For a further discussion on the ability of fleets to pass on costs, please see the response in section 3)e)vi) in this chapter of this FSOR.

Finally, we would like to note that in an independent review of staff's cost analysis for the regulation, Dr.Neil Eldin, a professor and head of the department of construction technology at the Purdue School of Engineering and Technology, stated that fleets should be able to pass on costs as they have always done for other cost increases they have faced such as fuel, insurance, etc. Dr. Eldin predicted that construction firms will still remain profitable, even considering the compliance costs of the regulation. The review was entitled "An Examination of the Construction Industry Compliance Costs for CARB's Off-Road Diesel Vehicle Rule", and was submitted to the rulemaking docket by a commenter as a 45-day comment. It is available on ARB's website as comment 21 presented during the May Board hearing at www.arb.ca.gov/lispub/comm/bccommlog.php?listname=ordiesl07. Please see Dr. Eldin's review for a list of his professional experience and qualifications.

3)a)i)2) Affordability of Complying Twice

- 1. Comment:** The notion that equipment must be retrofitted with VDECS only a few years before it must be replaced with Tier 4 engines is one of the most ludicrous anti-business proposals ever. (EUCA)

2. **Comment:** The Rule is based on Tier 4 technology and the Tier 4 engines will not be available until 2014. We cannot afford to repower now and then again after 2014. (DER1)
3. **Comment:** Caterpillar repowers to date in California comprise 2% of needed repowers, and were wasted because Tier 1 and 2 will have to be replaced later; Tier 1 and Tier 2 are not acceptable in meeting the end goals of PM and NOx targets. (QC) (QC2)
4. **Comment:** The regulation will force California contractors and equipment owners to park, sell or scrap their older equipment (Tier 0), most of which have a lot of life left in them. The balance of their current equipment (Tier 1 and Tier 2) will have to be upgraded to the current Tier 3 technology, which in itself will be extremely expensive. As soon as the Tier 4 technology is developed, contractors and equipment owners will again be forced to upgrade their Tier 3 engines to Tier 4. (SIEVERT1)
5. **Comment:** Only the largest, most progressive companies have the resources to replace or repower most of their vehicles with Tier 3 equipment commencing in 2010 and again with Tier 4 equipment commencing in 2014 or 2015 in order to comply with the 2020 fleet average. (CIAQC2)

Agency Response: As discussed in the response in section 6(a)(i) in Chapter III-A-6 of this FSOR, the need for NOx and PM reductions from off-road vehicles is immediate, and therefore the requirements of the regulation must necessarily start before the introduction of Tier 4 and Tier 4 Interim vehicles into the off-road market. However, while the emission reductions from Tier 4 and Tier 4 Interim vehicles will be significant, all early repowers contribute to reducing emissions, and staff does not believe that any prior repowering effort was a waste. Under the regulation, fleets that have performed early repowers (to at least a Tier 1 engine) will have a lower NOx fleet average to begin with, and will receive carryover turnover credit that can be used later. This lower fleet average and early credit means the fleet will have lower compliance costs later.

As presented by staff at the May 25, 2007, Board meeting, a fleet does not need all Tier 4 and Tier 4 Interim vehicles to comply with the final requirements of the regulation. Staff has shown that a fleet can comply with the final compliance requirements utilizing a mix of vehicles with Tier 2, Tier 3, and Tier 4 engines. As such, any repowers of Tier 0 engines completed now (to the Tier 2 or Tier 3 level) will not necessarily need to be replaced with Tier 4 vehicles at a later date, especially if VDECS are installed on these newer vehicles and engines. This means that an investment in newer engines and vehicles now, in conjunction with the installation of VDECS, is not a wasted investment. Staff does acknowledge that while Tier 1 vehicles can potentially be in compliance with the final

requirements of the regulation, ultimately most of them will have to be upgraded. However, the regulation does provide that Tier 1 engines have a guaranteed life until 2013.

Also, to ensure that fleets have an opportunity to recover their investment in the installation of VDECS, the regulation gives VDECS a guaranteed life of 6 years (per section 2449.1(a)(2)(A)4.c.) before any vehicle retrofit with highest level VDECS would be required to be turned over. Therefore, equipment retrofit with VDECS will never be required to be replaced just a few years later with Tier 4 engines. In addition, in some instances, VDECS may be removed from a vehicle being retired or from a vehicle that is being sent out of state, and be reused on another vehicle in the fleet. If this occurs, a fleet may potentially reuse a VDECS without any additional cost to the fleet.

3)a)i)3) Cannot Afford New Equipment

- 1. Comment:** I cannot afford new equipment. I buy used equipment 5 to 10 years old - this is all I can afford to purchase. (DMCI)
- 2. Comment:** If we buy a new piece of equipment, we would take it out on two to a five-year loan. Probably, actually, more likely three to five years. We would be forced to do this every year. We simply can't afford it. I'm not going to stand here and say that it's impossible for us to survive with this regulation in place, but it makes it considerably scarier of a proposition with this regulation in place. (AAWC2)
- 3. Comment:** I could never afford to buy new equipment. Machines that are near the end of their working lives are useful to a cross section of society who cannot afford to purchase and expense new equipment. (PINETTE1)
- 4. Comment:** I can not afford to keep modifying my existing equipment. I can not afford to purchase new equipment that might need MAJOR modifications every few years. I can not afford to junk equipment that does not meet emission standards for resale in the state of California. With the increased cost of building products and fuel, it is already difficult enough to perform affordable work. (SE)
- 5. Comment:** The industry is in such a state of confusion with no clear-cut answers for a person like me with a large fleet of older equipment. Even though I have tried to update my equipment over the years, I find myself in a potential non-compliant situation. To buy all new equipment is not an option for me. Engine replacements (repowers) are expensive and I'm learning that dealers won't guarantee compliance on engine replacements. (EEI)

- 6. Comment:** We cannot afford to buy new equipment and there will be no used equipment on the market that will comply with the new CARB regulation. (LOUKIANOFF)

Agency Response: The regulation intentionally does not require the purchase of new vehicles. As presented by staff at the May 25, 2007, Board meeting, a fleet does not need to be entirely comprised of vehicles having Tier 4 and Tier 4 Interim engines to comply with the final requirements of the regulation. A fleet can comply on the final compliance date with a mix of vehicles having Tier 2, Tier 3, and Tier 4 engines. A fleet has many compliance options, such as repowering their vehicle with a cleaner engine, buying a new or used vehicle, using NOx and PM VDECS if available, retiring vehicles, or designating vehicles as low use. Staff believes that most fleets will comply by largely purchasing used vehicles.

Additionally, as stated in the response in section III-A-2(g) of Chapter III-A-2 of this FSOR, staff expects there to be adequate used vehicles available for compliance.

Please see the response in section III-A-3(d)(viii) of this chapter of the FSOR for a discussion of repower costs.

Please see also the response in section III-A-16(p) of Chapter III-A-16 of this FSOR for a discussion of outreach ARB staff plans to conduct to reduce the confusion surrounding the regulation mentioned by commenter EEI.

3)a)ii) Not Affordable for Small/Medium/Minority Businesses

- 1. Comment:** As a small business owner with aging equipment, virtually any regulation restricting the use of my tractors would be crippling! The equipment is not valuable enough to be re-powered. (WEBER)
- 2. Comment:** My wife and I own a few pieces of equipment, and we have no employees. There is no way I can afford to retrofit or replace this equipment. (PBL)
- 3. Comment:** Small contractors provide an affordable service to the community that the big companies cannot. If the small contractors like me are put out of business the general public will be at the mercy of those that provide the kind of service they cannot afford. To buy all new equipment or to go to any great expense to retrofit my equipment could put me out of business. I replace my equipment as needed, not as desired. And I cannot afford to always buy new; a machine a few years old with low hours is usually the better choice for the small contractor like me. (WORTMAN)
- 4. Comment:** While many of California's larger construction companies have already begun the process of repowering or retrofitting their fleets in anticipation of these regulations, the smaller companies with less than five

employees, which make up more than 55 percent of California's industry, will be severely hampered by the costs of repowering or retrofitting equipment that, in some cases, are the sole assets of the family-owned business. (ARTBA1) (ARTBA2) (MALDONADO2) (MCCULLOUGH) (MILLER) (SR) (VC&M)

5. **Comment:** It does not seem reasonable to outlaw the use of older vehicles and force well-maintained, good productive equipment into retirement and be sold out of state. This is a plan that must have been conceived by people that have no economic insight. It only seems logical that as the equipment ages it will be replaced, or will be operated very few hours a year. If you do not allow equipment to be replaced through attrition, you will ruin the majority of contractors, which are small family owned business. (DMCI)
6. **Comment:** I am convinced that this regulation will be the death of many small and medium sized businesses such as our company. It is impossible to comply with the replacement and/or retrofitting schedule of the regulation. (HBE)
7. **Comment:** I have four or five pieces of equipment that would fall under the regulation; however I'm the sole operator, and only one piece is running at any given time. I'm 58 years old. It took the first 35 years of my life to reach a point where I had the capital and collateral to buy my first piece of used equipment. I sat in that seat for twelve years before I had enough to finance my next piece of equipment, and so on. Not infrequently, I have to borrow money in the winter months to survive, and then spend a good part of the summer working to pay it off. There is no way I could rebuild my 'fleet' to meet your criteria. I have neither the money nor the time left to do so. You will be forcing me to retire at 63 years of age with absolutely no income outside of social security, which will cover about half my house payment. (GE)
8. **Comment:** I work for a small company and we use our forklifts about 3 times a day. It is not a lot, but we would not be able to afford the upgrades, and without the lifts, we would go out of business. (YBARRA)
9. **Comment:** Why not let attrition take care of this problem instead of running these small business people out of business? (FITZSIMONS)
10. **Comment:** Very few small businesses can afford to spend the kind of money required to upgrade equipment. (NEVADA)
11. **Comment:** The current regulation will cripple my business and possibly put me out of business. We cannot repower our equipment with new engines to comply with your regulation without severe financial hardship

as well as an investment sometimes costing greater than the value of some of our equipment. There are alternate fixes that are much more economical and would allow us to use our existing power plant and still reducing emissions to an acceptable level. I urge you to rethink your position and ask if you really want to destroy small businesses who are already burdened enough with marginally effective laws and red tape that chokes us financially, when alternate methods exist with more reasonably prices. (WILSON)

12. Comment: The regulation will cause most small business owners to leave California. I cannot sell my equipment to get a down payment for a new one so what other option do I have. (DALES)

13. Comment: We run a small construction operation. We employ between 20 and 50 workers. We have one essential piece of diesel equipment. If your new diesel regulations are enacted, we will be forced to sell or scrap this machine and could be forced to close our business. Our profit margins are thin, hence we cannot afford to refit this machine or purchase a new one. We are not alone. I urge you to take smaller operators such as ourselves into consideration before you enact any legislation that will have such a negative effect on us, our business and our employees. (CARY)

14. Comment: Do not vote to wipe out small contractors by making them replace their older diesel powered equipment. We cannot afford to do so, and will continue as criminals. You will wipe out thousands of small contractors; construction work on small scale will come to a halt. Private parties will have no one to build homes, etc. This will affect everyone state wide. (WORKERD)

15. Comment: Many companies like mine are small and lack the resources to repower or replace our equipment, especially when we are faced with the prospect of doing it again several years from now when diesel engine technology catches up to the new standards. (MICHROWSKI)

16. Comment: The regulation will hit small firms especially hard, as most cannot afford to purchase new equipment costing hundreds of thousands if not millions of dollars. They will be forced to sell their machinery at basement prices to out of state users, and for many this will simply be the end of the line – they will go out of business. (SLOCBE)

17. Comment: We are especially concerned with the small and medium sized businesses within the industry. These owners that can least afford it will be forced to retrofit, repower, or replace not only their trucks but off-road equipment first if they wish to stay and operate in an industry that many have been in for 30+ years or more. We ask as an Association that you deeply consider this financial burden you are placing on these small

business owner-operators and consider ways to minimize this burden. (CDTOA2)

18. Comment: The regulation appears to disproportionately affect small businesses. While we appreciate that some efforts have been made to differentiate between fleet size and the implementation timelines associated with the regulations, it is clear that these regulations will adversely impact businesses relative to their ability to comply with the new standards. It is fair to assume that many businesses have not finished paying for equipment that would require retrofitting or replacement under the regulations. This will have a stifling impact on small businesses seeking to expand their operations, particularly those looking to conduct business outside Captive Attainment areas. (BCL)

19. Comment: Small business persons never have the funds to convert overnight to new technology diesel standards. (MCCLERNON)

20. Comment: I'm a very small contractor. I mow flood control ditches for about 4 clients with very specialized mowing equipment that is moved from place to place with my own truck. This regulation will wipe out guys like me. ARB's regulation would prohibit me from using my machines (which were legal and compliant when I bought them). Then I would be expected to go out and repurchase my machines brand new (because any machine more than a year or two old won't comply) when even now the business cannot justify new equipment. I'll have the old debt, plus new debt required for the purchases. Since I work for public agencies, they will be forced to make me comply, or they won't be able to use me. Even charging my customers more can't make this work – what do you expect a guy like me to do? (CDTOA1)

21. Comment: For small contractors, the equipment is used intermittently. I only work 6 months of the year, due to weather and only have work part time then, due to a small economy. Therefore, it does not pollute much and I can't afford to replace it. I have to buy and used old equipment, most private lands owners are not aware of the negative effect your regulation will have. (WORKER)

22. Comment: This is just my personal submission of how these regulations will affect my small business that I have owned for 30 years. I am a small contractor with a fleet of 12 backhoes, skid steers and mini-excavators. All are Tier 1 motors. I would be forced to replace or repower 1 backhoe or 2 skid steers each year in order to be in compliance. I normally replace my equipment after 15 years and this would cause me to retire my tractors 5 years sooner than I normally would. At this time when the economy is so down related to construction, this would put me out of business completely and my 20 employees would no longer have jobs! (ABBS1)

- 23. Comment:** I cannot purchase any further equipment, and given my existing long term debt, I cannot afford to do this on a yearly basis. The equipment fleet in use consists of 8 pieces, with backhoes costing approximately \$90K and the size excavators we utilize ranging up to \$250K. Let me emphasize, I am a SMALL business owner. (EUCA3)
- 24. Comment:** I am the owner of a small construction business. This will put us out of business. We cannot afford to replace our equipment or the engines. This is completely outrageous. (HALLETT1)
- 25. Comment:** According to the regulation, as of the end of 2009, I as small family run a 2 person tree trimming operation for the last 29 yrs, will be faced with buying all new equipment & have to dispose of my old equipment that was purchased back in the late 1980's. Notwithstanding that I took care of my equipment and kept it running well, and did not contribute to the throw away society that we seem to have become. Being 55 and doing this part time into my old age, I will not be able to afford those new machines which the cost will total over \$100,000. What you are doing is just not right. You will put me out of business, as well as many others. (PB)
- 26. Comment:** We have a 49 horsepower Deutz engine on a trencher that we use occasionally. We cannot afford the loss of this unit. (MWS)

Agency Response: We acknowledge that small fleets (those with less than or equal to 2,500 horsepower of affected vehicles) have limited resources and capital access when compared to medium and large fleets. In recognition of this, we built provisions into the regulation to make it less burdensome on small fleets. Small fleets are not subject to the NOx requirements of the regulation, which means they are not subject to any accelerated turnover requirements. Thus, the many comments that expressed concern that small fleets could not afford to retire, replace or repower their vehicles (including PBL, WORTMAN, ARTBA1, ARTBA2, MALDONADO2, MCCULLOUGH, MILLER, SR, VC&M, DMC1, WILSON, DALES, CARY, WORKERD, MICHROWSKI, SLOCBE, CDTOA1, WORKER, ABBS1, EUCA2, HALLETT1, PB, MWS) reflect a misunderstanding of the regulation's requirements. Starting in 2015, a small fleet needs to only meet the PM fleet averages, or install PM VDECS on 20 percent of their total fleet horsepower to be in compliance with the regulation.

Comments DMCI and FITZSIMONS suggest simply allowing attrition to bring down emissions. Please see the response in section 6(a)(i) of Chapter III-A-6 of this FSOR for a discussion of why we cannot wait for attrition to bring down emissions from off-road vehicles.

For a discussion of the cumulative impact of the regulation and other ARB regulations mentioned in comment CDTOA2, please see the response in section 3)b)xiv) in this chapter of the FSOR.

A fleet does not need to own all Tier 4 vehicles to be in compliance with the regulation. For a discussion on complying without new or Tier 4 vehicles, as mentioned in comments MICHROWSKI and CDTOA1, please see the discussion on double control in the response in section III-A-3)a)i)2) in this chapter of the FSOR.

As discussed in the response in section III-A-1)g) in Chapter III-A-1 of this FSOR, staff disagrees that engines, such as those used by commenter WORKER, do not pollute.

See also the response in section III-A-3)a)i) regarding the affordability of the regulation.

27. Comment: The regulation will dramatically affect the economy as a whole and put many small businesses out of business. (DEFOREST)

28. Comment: The regulation will have a profoundly negative impact on our ability to stay in business. We're a small family-owned underground construction firm specializing in public works infrastructure rehabilitation. We have a 50 percent chance of survival. (WPC1) (WPC3)

29. Comment: There are significant alternative costs to the regulation, and in the short term this regulation will have a very large impact on small businesses especially. In the past we have been able to understand that controlled sources do pass on their costs to the public. And in this particular case, they'll also be passed on to the public. But in the meantime there's going to be a lot of small businesses affected as that cost does transfer. (CAPCOA2)

30. Comment: AGC disagrees with ARB's findings and maintains that the regulation will still disproportionately increase costs for small fleets and put a significant percentage of California's contractors out of business. (AGCA3)

31. Comment: This regulation is structured in such a way that small business' cannot comply and survive. ARB should reconsider the adoption of this regulation in favor of one that will not put so many small contractors out of business. (AAI)

32. Comment: A majority of construction companies in the state are small businesses with five employees or less. The imposition of this regulation

within the regulation timeframe will place an extreme financial hardship on them in meeting the regulations obligations. (MALDONADO2)

33. Comment: The construction industry is made of mom and pop operations, small and medium-size businesses who employ 15, 20, 25 people. The regulation will cause them to disappear. (OE4)

34. Comment: The big operators are already turning over their equipment on a regular basis. The small guys are always the ones to take it in the shorts. (PNETTE1)

35. Comment: To make everyone change out or adapt their existing equipment would put an unreasonable financial burden on businesses. The regulation could cause some small businesses to close their doors. (BUSH)

36. Comment: Requiring exhaust retrofits on many older pieces of equipment will definitely be too expensive for most small operations, and probably cause many to go out of business. (BENKER)

37. Comment: We are a small company with limited resources, and will not survive the implementation of the regulation. (GRAFF)

38. Comment: The regulation will put small businesses out of business, or severely hurt them, which would put a much larger drain on California than we could handle. (LITTEN)

39. Comment: Small businesses will be in jeopardy to fail with all the rising cost of insurances, fuel and now an additional expense to our existing off-road vehicles. (PULLMAN)

40. Comment: I have looked over the regulation and once again the government is willing to pass a regulation that is detrimental to small business, inflationary, and meaningless. Larger businesses can handle the added expenses. (STEWART)

41. Comment: More programs should be available to help the industry make the change. This is a big industry with a lot of small businesses (family businesses) that just make a living and do not have a lot of money to make the change over. (AWD)

42. Comment: I know that the burdens of all government regulations are most visibly borne by a particular group of individuals - in the case of this regulation, that group will be the owners and employees of small to medium-sized heavy construction contractors and the allied businesses that serve them. (TURNER)

43. Comment: I am truly mortified at what this regulation would do to my future. The tough part will be for the not so large companies and people like me. Small business provides the majority of the "horsepower" for the construction industry and in turn for the economy. By placing such a cost intensive regulation on industry, you will be choking off any chance for the little guy to prosper. (MARTIN)

44. Comment: Most construction is built by small business. According to RMA, approximately 65% of all construction companies have 10 employees or less. These are not large faceless enterprises but, ones comprised of a few individuals who are working as a team and who are impacted greatly with changes. These small businesses may be unfairly treated by the implementation of this regulation. I strongly feel care should be taken in the formulation of these regulations. (SCI)

45. Comment: This regulation is going to create a severe burden on my small company. (STOWE1)

46. Comment: The regulation will have a serious financial impact upon our small business. (SEC)

47. Comment: I am a very small, seasonal earthwork and paving contractor, and the regulation would put my company out of business. I am all for cleaner air, but do not feel that this is the way to do it. More research is needed, and more options, especially for the "little guy" like us. (MCORP)

48. Comment: The regulation will result in negative financial aspects that affect subcontractors' businesses as "end-users" more so than the manufacturers of the improved engines and equipment. Retrofitting equipment will cost small businesses, according to CARB's own analysis, \$48,000 over the equipment's lifetime (@ \$48/1 hp) and \$2,000 per year based on 1,000 hp thereafter. Smaller businesses may not even have the volume of work to justify the initial cost due to fewer hours of equipment use. Their monthly bottom line to pay their workers and buy materials will drop which will impact the timeliness and quality of their work, and mean loss of jobs. Single piece replacement or retrofit costs the smaller businesses more than fleets of new equipment costs large businesses; this results in unfair competition to smaller subcontractors. Larger and wealthier out of state competitors will enter our customer territories and cause us to lose bids. (ASA)

49. Comment: Small firms control approximately 28% of the construction equipment in the state. Only 2% of the state's construction companies employ 100 persons or more and they own approximately 36% of the statewide construction fleet. The balance of the firms between 20 and 100

employees own the remaining 36% of the equipment. The cost of the regulation falls disproportionately on these small and medium companies. (CIAQC8)

50. Comment: This regulation will likely reduce the number of high-wage union jobs and also pose a considerable threat to small and minority-owned businesses that may be unable to make the significant investment of compliance. (MARGETT)

51. Comment: The regulation will result in devastation or closure of many contractors, many of whom are minorities. (ECA)

52. Comment: Consolidation will be a fact of life in California construction, with significantly fewer small companies. They will bear the burden of these regulations due to their limited capital access, even though they may be more productive, higher-valued to their customers, and account for more job creation. Many of these small contractors may be the most efficient and innovative in the industry. This could create the unintended consequence of less innovation and lower productivity, leading to an industry with greater rather than less pollution. (AE)

53. Comment: The regulation will crush small and minority owned companies. In the construction industry, where virtually every job is based on competitive bidding, passing on costs assumes a level playing field, which is not the case for small and minority-owned firms. These firms already compete in an environment where a very few giant companies dominate the landscape. All of the observations in our comment will be exponentially more serious impacts to minority and small firms, as they are the least capitalized and most subject to economic downturns. (EUCA1)

54. Comment: This regulation is just going to destroy all but the largest general engineering contractors that own construction equipment and depend on it for their living. (FCICI1)

55. Comment: What most are not aware of is that three out of four construction companies in California have 10 or fewer employees, and this is very true in our geographical area. Without a regulation that takes all these factors into consideration, Californians risk seeing new, ineffective regulations that will cost us good paying construction jobs. (BECC)

56. Comment: Small General Engineering Contractors like me find it hard to compete with all the State regulations already imposed upon our companies. As a small business owner I am finding the State of California offers little incentive for me to stay. I am not a minority, and I am under 10 employees. This new regulation benefits big business and deep pockets. (AANESTAD)

- 57. Comment:** To require retrofits on equipment owned and used every day by contractors that are making money with the equipment is one thing. To require small contractors that have one or two pieces of equipment has the potential of forcing them out of business depending on the cost of the retrofit. (PATTERSON)
- 58. Comment:** The sector's vulnerability is in part due to the fact that it is dominated by small firms. Fifty-five percent of California construction firms have fewer than five employees; with 74 percent employing less than ten individuals. Less than one percent of the state's construction firms have more than 250 employees. Smaller firms bear a higher burden of regulatory costs on average than larger ones. In particular, environmental compliance cost for firms with less than 20 employees are more than triple those larger firms. Since smaller construction firms tend to rely more on rental fleets, this will effectively increase small fleet costs even though the regulation is supposedly designed to mitigate small fleet impacts. (CIAQC1)
- 59. Comment:** Many people have said that this industry is mom and pops. There are a lot of small contractors out there. What you are basically going to be doing is confiscating their wealth and their retirements. (SPR)
- 60. Comment:** This regulation will put the small owner/operator completely out of business. (EVANS1)
- 61. Comment:** I represent approximately 650 different construction and related companies throughout the San Joaquin Valley. And of those, many of them are site-work people that use the off-road equipment and the vast majority of those people in that field would be considered in the small fleet size. And I think the best thing that I kind of came up with was we all have a personal budget that we work with on a monthly basis. We get our paychecks and we decide how we are going to spend them. And let us just say for argument's sake, that our budget says we can drive a medium age Chevrolet as our vehicle. And then a third party comes in and does an evaluation of our budget and says, well, in two years, you need to drive a Mercedes and you say well, we cannot possibly afford that, but you do not have a choice in the matter. And I am not saying – with all respect to the numbers that are being evaluated, that's just the nature of a third party kind of an evaluation. When it is your money; it is a lot different than when somebody else is looking at it. If I were to tell you that you needed to do that, you would probably have a lot of arguments. And I think that the group that I speak for, they are all out there every day. They are out there today busting their rear-ends to make ends meet, and they don't have the kind of money to make those changes in the time line of the regulation. (BES2)

62. Comment: This regulation will crush my business if passed. We are small construction but would probably be considered a medium size company according to this regulation. The cost of upgrading or retrofitting my equipment is too great and we would not be able to recover our costs as each year we would be forced to upgrade. (ANDREINI)

63. Comment: Approximately 75 percent of our work is as a subcontractor for heavy highway and general contractors. This regulation will severely affect their ability to prosper and to hire us. In turn, we will not be able to continue to hire and train and employ hazardous material workers, truck drivers, and the necessary support staff, again the majority which are minorities, including approximately 20 women. I implore you to please consider the negative impact this regulation will have on the construction industry, small and medium specialty contractors like me, and most of our employees. (BRICKLEY)

64. Comment: According to a recent study for the U.S. Small Business Administration, smaller firms bear a higher burden of regulatory costs on average than larger ones. In particular, environmental compliance cost for firms with less than 20 employees are more than triple those larger firms. (CIAQC6) (AGCA3)

Agency Response: We acknowledge that there are many small fleets affected by the regulation. Indeed, ARB staff's own analysis from our survey data shows that approximately 78 percent of fleets are small, which in the regulation is defined as having less than 2,500 horsepower of affected vehicles. We also acknowledge that small fleets have limited resources and capital access when compared to medium and large fleets (as noted in comment AE) and that environmental compliance costs can put a burden on small firms (as noted in comments CIAQC6 and AGCA3).

In recognition of these concerns, we built provisions into the regulation to make it less burdensome on small fleets. Small fleets are not subject to the NOx requirements of the regulation, which means they are not subject to any accelerated turnover requirements. Small fleets are also given additional time to meet the PM requirements. Because of these exemptions, the compliance costs for small fleets are expected to be lower in total than for medium or large fleets (as discussed in section E of Chapter VII of the Staff Report). Although the small fleets will have lower compliance costs, staff acknowledges that VDECS can still be costly for these small fleets. However, staff expects that the costs of these devices will decrease over time as more VDECS become available. With compliance not required for small fleets until 2015, more VDECS should be available and at a lower price.

With the 2015 initial compliance date, many small fleets will also have the opportunity to pursue the use of incentive funds, such as those available through the Carl Moyer program to install needed retrofits or repowers early. Additionally, because small fleets' compliance begins later, their fleets will have had a greater chance of natural turn over, bringing fleets closer to the 2015 targets. This could offset some or all of the regulation's impact for small fleets.

The ANDREINI comment raises the concern that the regulation incorrectly defines some small firms as medium. We made several changes to the regulation as proposed in the Staff Report to help ensure that truly small fleets would be defined as small in the regulation. First, we raised the small fleet threshold to 2,500 hp in the first Notice of Public Availability of Modified Text and Availability of Additional Documents. Second, we removed the requirement that small fleets also meet the Government Code definition of small business in the second Notice of Public Availability of Modified Text and Availability of Additional Documents. We recognize that wherever we set the threshold for small fleet, some fleets will be just above this threshold and may feel unfairly penalized, but the benefits of having special provisions for small fleets outweigh this drawback.

For a more detailed discussion on the affordability of the regulation, please see section III-A-3)a)i) in this chapter of this FSOR.

Additionally, it is expected that fleets will be able to pass on most of the compliance costs to their customers. For a more detailed discussion on passing on compliance costs, please see the response in section 3)e)vi) in this chapter of this FSOR.

Commenter AWD suggested that more programs should be available to assist fleets in complying with the regulation. For a discussion on available funding, please see the responses in section III-A-6)e) in Chapter III-A-6 of this FSOR.

We disagree with comments ASA and AANESTAD, and do not believe that larger businesses will have an advantage when complying with the regulation. Smaller fleets have less stringent compliance requirements than large fleets, and will therefore have lower compliance costs. For a further discussion on how the costs of the regulation vary by fleet size, see section D of Chapter XI of the Technical Support Document.

For a discussion on job losses, as mentioned by commenter MARGETT, please see the responses in section 3)g) in this chapter of this FSOR.

Additionally, we disagree with comment AE that this regulation will create a lack of innovation and reduced productivity. As described above, the regulation contains a number of provisions to make it less burdensome for smaller contractors, which comment AE describes as the most innovative and productive. Also, we expect that many fleets will become more innovative as they discover

ways to comply with the regulation while meeting their needs as a business. Like any other challenge faced by business, we expect the regulation will foster innovation.

65. Comment: As the manager of small business which is trying to grow the new CARB regulations will have a devastating impact on our business. Our fleet needs to grow in order to keep up with our volume; however, we cannot afford to invest in equipment that is going to be obsolete in just a few years. As a result we will be forced to lay off our work force and downsize/or close our business. (LOUKIANOFF)

Agency Response: There are no turnover requirements for small fleets; therefore vehicles owned by small fleets will not become obsolete.

Please see the responses to comments 1 to 64 above in this section of the FSOR for a discussion of the affordability of the regulation for small fleets.

66. Comment: A lot of this equipment does not run 4 hours per year - how could they have that large of a problem? Many of them can not be upgraded – this would be a very large burden on small operator and very unfair. (YOUNG)

67. Comment: I operate 2 older pieces of equipment in my business. One is a 1984 Backhoe 63hp and the other a 1998 Skid Loader 61hp. Both of these machines are used approximately 100 hours per year. It would not be cost effective to retrofit or replace these machines due to the low usage. The regulation will force me to retire the machines with no resale value and use rental equipment. My ability to be competitive in the small amount of work I do with these machines is based on low equipment costs. I would be forced out of the small contractors market. I feel there should be some sort of exemption for small fleets and small business. (PAULSELL)

Agency Response: Vehicles used less than 100 hrs per year are defined as low use vehicles in the regulation. Fleet owners are only required to report and label low-use vehicles; low-use vehicles do not have to meet the PM or NOx performance requirements. Therefore, low-use vehicles never have to be replaced or retired, and they are never required to have VDECS installed. For a more detailed discussion of low-use vehicles, please see the response in section 3(k) in this chapter of this FSOR.

The fleet described in the PAULSELL comment would be defined as a small fleet since it has less than 2,500 hp. As discussed further above in the responses to comments 1 to 64 above in this section, a small fleet is never required to replace, retire, or repower their vehicles; only the PM performance requirements must be met.

68. Comment: I feel that ARB has not taken an adequate look at the damage this regulation will cause economically. We have a small fleet of less than 1,000 hp. Since we are not a small business according to California law, we are subject to the medium size fleet regulation. Even at that, the direct impact to our company although significant, is not insurmountable, but what we do is down stream from the larger companies. As they struggle with compliance, the effects will trickle down to us. (J&M)

Agency Response: We removed the requirement that small fleets also meet the Government Code definition of small business in the second Notice of Public Availability of Modified Text and Availability of Additional Documents. Thus, the fleet described in the J&M comment is now defined as small. Please see the responses to comments 1 to 64 above in this section of the FSOR for a discussion of the affordability of the regulation for small fleets.

69. Comment: The City's Department of Public Works (DPW) is concerned about the potential impact of this regulation on Small, Woman-owned, and Minority-owned Business Enterprises (SBE/WBE/MBE), many of which may fall under the medium or large fleet categories. These types of businesses work on City public works construction projects, as both prime contractors and as subcontractors. The City performs outreach to these contractors for this purpose. The City's DPW is interested in maintaining a pool of viable contractors after this regulation goes into effect. At this point, we are uncertain as to the economic impact of the regulation on SBE/WBE/MBEs and the other small-to mid-sized businesses that must comply with the medium/large-fleet compliance targets. As a result of this uncertainty, the potential impact of the regulation on the size and composition of the City's bidding pool is uncertain. (LACITY)

Agency Response: We do not agree that the regulation will have an adverse effect on SBE/WBE/MBE fleets. For a more detailed discussion on affordability, please see the response in section 3(a)(i) in this chapter of this FSOR.

70. Comment: The cost will be more than \$5,000 (five thousand dollars) per 75hp engine! Simply put, this will be devastating for us who are small farmers! (FV1)

71. Comment: Is it there intention to destroy small business, farmers, etc.? I'm stunned actually. This will literally shut our business down. Do the "powers to be" know that they will lose billions of tax dollars if small businesses leave California or just decide to close their businesses? (HALLETT2)

Agency Response: As stated in section 2449(e)(11), vehicles used for agricultural operations are exempt from the regulation. Therefore, farmers will not

be affected. For affects on small businesses, in general, see agency responses to comments 1 through 69 above.

72. Comment: Replacing my chippers could cost me \$20,000 a piece (difference between value of old chipper and new machine) which is a HARSHIP ON MY SMALL 4 MAN BUSINESS. It is already hard enough to operate in California. (BTS1)

Agency Response: The vast majority of chippers are not self-propelled and therefore are exempt from this regulation. (They may be subject to the portable engine air toxic control measure, but that is irrelevant to this regulation.) Therefore, it is unlikely that the commenter will be affected by the regulation. If he has mobile chippers, however, if he is a small fleet, he will be subject only to the small fleet provisions, as described in the first response in this section, section 3(a)ii).

73. Comment: Many of our logging companies are small businesses that are extremely limited in their income and ability to spend money on the retrofit, repowering, or replacement of new equipment. These companies will be struggling to comply with the regulation under any circumstances. But to impose high costs too soon on our industry, and without clear assurances that these costs and purchases of new equipment will meet CARB requirements for years to come, will be disastrous. (ACL)

Agency Response: As stated in section 2449(e)(11) of the regulation, all equipment used at least 50 percent of the time for agricultural purposes (including logging) is exempt from the performance requirements of the regulation. Therefore, logging businesses will have no costs associated with the regulation.

3)a)iii) Downturn in Economy

- 1. Comment:** There is a downturn in the construction industry. (CIT) (EUCA7) (SACBES) (SHAWM1)
- 2. Comment:** The regulation forces contractors to either reduce size or take on new equipment payments year after year with no consideration to what the market will support. (AAI)
- 3. Comment:** These new regulations and the upcoming recession that our industry's about to face is making me seriously consider not owning my own business but finding another route of making money. (CAR2)
- 4. Comment:** As we are a small to mid-sized contractor and are already experiencing the effects of the downturn in the housing industry. Several of our large clients have stopped building in our area or are downsizing drastically. (BECKER)

5. **Comment:** We are currently laying off due to decreasing work loads and then the additional burden of replacing equipment or repowering equipment would be catastrophic to my business. During a period of decreasing work volumes we also have reduced profits and very little money to replace equipment or repower equipment so the transition is most difficult. (BKE)
6. **Comment:** The construction industry is in the worst slump of recent years. So the expected boom in the public sector will not help finance the capital expenditures required. (ESCOBEDO)
7. **Comment:** The building and construction industry is already suffering severely this year due to the real estate recession. The regulation may have a catastrophic impact and could essentially stop all construction activity. (DENHAM)
8. **Comment:** There are no exceptions for economic hardship in the regulation. You are forcing our industry to band together and defend ourselves. (DER7)
9. **Comment:** Over the next 13 years you will be requiring the fleet owners of California to incur a substantial expense without regard for economic fluctuations. The regulation will be difficult to comply with during strong economic years, and nearly impossible in weak years. (KRC)
10. **Comment:** The current downturn of the construction industry coupled with rising fuel and labor costs have already had an adverse effect on small and large businesses. To impose stringent time frames for which to implement the fleet average emission limits would create additional hardship by forcing insurmountable capital expenditures. (APCA)
11. **Comment:** As a California licensed contractor I know that such regulations are not to be implemented in such a time, where business is very slow in San Diego County, unless it is ARB's wish to put us all out of business. (DD)
12. **Comment:** I've survived four recessions in the 40 some years that I've been active in this business. And I can tell you that when it comes back around, it doesn't come back around with all kinds of gold on the horizon. You start to get going and you get a little bit more and you get a little bit more. And you can't just bring a piece of equipment back in and just spend a lot of money on it, because we're still trying to pay back the bank that got us through it, which, by the way, I brought these headlines of yesterday's newspaper, "Record Home Defaults," and this is a good subject matter that you're talking about. And I really hope you come up

with some way of solving the problem, should there be a serious downturn in the market. (DCC13)

Agency Response: While commenter DER7 is correct in that the regulation does not contain specific provisions (such as a suspension of the regulation or lesser regulatory requirements) to address economic slow down or hardship, it does contain a number of provisions that will reduce the economic impact of the regulation during economic downturns. First, the fleet averaging provisions allow a fleet to take hours of use into consideration when calculating their fleet average, thereby allowing them to prioritize their compliance on their vehicles that are being used the most. Also, fleets can take advantage of the low-use provisions, thereby not having to count the horsepower of vehicles, which may not be in regular use during the downturn, in their fleet average calculation. Fleets may permanently designate vehicles as low use, which is equivalent to turning over that vehicle. Fleets also have the option to retire vehicles. Staff believes these provisions offer fleets a variety of compliance options during economic downturns.

Staff recognizes that the construction industry is cyclical, and is currently in a downturn. Throughout the regulatory process, many fleets and industry groups suggested an economic hardship provision that would provide relief from the performance requirements of the regulation if an economic recession were to occur. As stated in the response in section 6)k)vii)9) in Chapter III-A-6 of this FSOR, staff did not build an explicit economic hardship provision into the regulation for two main reasons:

- 1) One of the largest sectors covered by the regulation is the construction industry, which is by its nature a cyclical business. We did not want to structure the regulation in a way that would potentially excuse a large number of firms from compliance due to economic downturns that are part of the normal business cycle; and
- 2) ARB does not have resources or expertise to review the financial situation of each of the nearly 10,000 fleets affected by the regulation and make a judgment as to whether their financial resources are adequate to pay for compliance.

Also see the responses in section 6)k)vii)12) in Chapter III-A-6 of this FSOR as to annual cost cap was not included in the regulation.

Although there is no explicit economic hardship provision in the regulation, the Board directed staff to add a provision intended to soften the impact of the regulation on fleets during periods of economic distress when fleets are downsizing. At the July 26, 2007 hearing, the Board directed staff to modify the regulations to provide that, on or after March 1, 2009, a fleet that permanently retires a Tier 0 vehicle from service within California may count that vehicle in meeting both the diesel PM BACT requirements and the NOx BACT

requirements. Thus, a fleet that is downsizing can comply with the regulation without being required to do any additional turnover or retrofitting. This provision provides an additional measure of relief to companies that may be hit by financial hardship during an economic slowdown. The changes were made available as part of the first Notice of Public Availability of Modified Text and Availability of Additional Documents.

Finally, staff recognizes that compliance with the regulation will be financially challenging for some fleets and that some will need to pass compliance costs through to their customers. Please see the responses in section 3(e)(iv) of Chapter 3 of this FSOR for a discussion of the reasons why staff believes fleets can pass through some of the costs of the regulation to their customers. The reasons that staff believes the regulation will be affordable are discussed in the responses in section III-A-3(a) in this chapter of this FSOR.

13. Comment: If a fleet changes size from small to medium, they have two years to meet the medium fleet's requirements. If they go from medium to small, they can immediately start just complying with the small fleet requirements. If I have a piece and there's an economic downturn and my usage drops below the low use threshold, you could choose to designate it as low use and count it as part of whatever required turnover you would have had to do, or if you are just waiting to get another project next year, I may need to use it again, you don't have to count it as that. If you then subsequently decide to add this piece back into your fleet, you would have to meet the add-in vehicle requirements. And so that's when it would have to be cleaner than a certain amount. (DCC13)

Agency Response: We agree. If a fleet is growing in size (e.g., growing from a small to a medium size fleet), the fleet has two years to meet the medium fleet's requirements. Conversely, if a fleet decreases in total horsepower (e.g., shrinking from a medium to small size fleet), the fleet can immediately start complying with the small fleet requirements. If there is an economic downturn, a fleet can shrink to a small fleet size by either retiring vehicles, or designating them as low use. If a fleet designates a vehicle as low use, but later decides to bring the usage of that vehicle above 100 hrs (i.e., the economy improves and more work is available), that vehicle may be added back into the fleet if the adding vehicle requirements are met, and no other immediate actions must be taken on that vehicle.

3)a)iv) Shrink to Comply

- 1. Comment:** ARB staff's regulation could cause over two thirds of the privately owned construction companies in California to shut down or at least downsize from a large fleet to a small fleet. (CIAQC2)
- 2. Comment:** Since the construction is a low-margin business, many contractors will be forced to reduce their fleets and in some cases go

completely out of business in order to be in compliance with these regulations. (MARGETT) (MCCULLOUGH) (MILLER) (SR) (VC&M)

3. **Comment:** The simplest and easiest way to comply with the regulation is to discard equipment. If a contractor is unable to fund the annual replacement of 8% of his fleet and retrofit 20% of the fleet, the only option is to reduce the size of the fleet until compliance is achieved. There are no means to achieve 90% or 95% compliance. Most small and medium contractors who are marginally capitalized will have to shrink equipment fleets and staffing in order to comply. (CIAQC7)
4. **Comment:** The only option to comply is to get rid of equipment. And when you get rid of equipment, you get rid of employees. And when you do that, you shrink your firm, you shrink your ability to do the job, and you shrink the kind of jobs and the amount of work that you can do. And your staff spent very, very little time on that option. But that for most of the guys in this room is the likely compliance option, to get rid of equipment, not to replace it, to repower it, or to retrofit it. No one in California should be proud to say that we are improving the environment by closing down thousands of small family-owned companies and eliminating tens of thousands of skilled, well paid construction jobs. (CBCC3)
5. **Comment:** Many contractors would be forced to retire equipment before the end of its useful life. If a contractor could not pay the annual replacement of 8 percent of its fleet and retrofit of 20 percent of the fleet – as required under the regulation – it would need to reduce the size of its fleet simply to achieve compliance. Most small, medium and other thinly capitalized contractors would have to shrink their equipment fleets and staffing in order to comply. (PILCONIS) (AGCA3)
6. **Comment:** It will take more money than we can ever make to comply with this regulation. We will be faced with downsizing our fleet by 50% or more to get down to the newest, cleanest machines that we have and then building back up to the fleet that we currently have now if we ever can. (FCICI1)

Agency Response: We acknowledge that some fleets may reduce their total horsepower to comply with the off-road regulation. As stated in section 2449.2(a)(2)(A)1.b., if a fleet is not able to turnover 8 percent and install VDECS on 20 percent of their total fleet horsepower, the fleet can reduce their Tier 0 horsepower to meet the requirements of the regulation. This provision allows fleets to comply with the regulation, without any direct costs such as vehicle replacement or purchasing retrofits, and is meant to assist fleets in times of economic hardship.

Although staff believes that some fleets will reduce their horsepower, we do not agree that most fleets will shrink to comply with the regulation. As stated in Chapter XII of the Technical Support Document, ARB staff estimates that over 70 percent of fleets are small; small fleets have no turnover requirements for the regulation. To be in compliance with the off-road regulation, small fleets only have to demonstrate (starting in 2015) that they either meet the PM fleet targets, or have installed VDECS on 20 percent of their total fleet horsepower. Because these small fleets to not have any turnover requirements, staff does not expect that these fleets will reduce their total horsepower to comply with the regulation.

Additionally, we also expect that job losses will not be significant. For a discussion on job losses caused by the regulation, see the response in section 3(g) in this chapter of this FSOR.

ARB staff does not believe that the regulation will put most of the contractors in the state out of business. For a more detailed discussion on the affordability of the regulation, see the responses in section III-A-3)a)i) in this chapter of this FSOR.

3)a)iv)1) Reduced Industry Capacity

- 1. Comment:** The regulation will reduce the availability of contractors to perform private and public works projects. (ECA)
- 2. Comment:** This regulation will force me to reduce my fleet size and work capacity. (AAI)
- 3. Comment:** To the extent the regulations induce firms to simply retire older equipment without replacing it, these firms' capacity to undertake construction assignments will be reduced. (CIAQC1) (CIAQC6) (AGCA3)
- 4. Comment:** A reduced fleet will limit the size and type of contracts that companies can bid on and will reduce the bonding capacity of those firms to do additional work. (CIAQC8)
- 5. Comment:** To meet ARB's regulation, businesses might need to downsize, laying off construction workers and reducing the capacity to build projects. (PILCONIS) (AGCA3)
- 6. Comment:** This regulation will force us to either over extend ourselves buying newer equipment, or reduce our fleet size by retiring old equipment. The latter move would reduce our capacity and eliminate jobs. (AAWC)
- 7. Comment:** I'm going to have to get rid of some of my horsepower. I don't know when I'm going to get a job requiring what piece of equipment that I

have. But I know that if I don't have that piece of equipment, I won't be able to bid that job. (DCCI2)

8. **Comment:** As contractors reduce their fleets to comply, their asset bases and their ability to bond are correspondingly reduced. Any wide-spread reduction in the capacity of the industry will delay projects and drive up costs. (CIAQC7)

Agency Response: As stated in the response in section III-A-3)a)iv) in this chapter of this FSOR, we do not expect that most fleets will reduce their total horsepower to comply with the regulation. Therefore, the capacity of many fleets will not be reduced. However, for those fleets that do shrink in size, there are other options, such as renting vehicles, that would allow a fleet to stay in compliance while maintaining their current capacity for projects.

For a more detailed discussion of the effects of the regulation on a fleet's finances, see the responses in section III-A-3)f) in this chapter of this FSOR. For a more detailed discussion of the effects on infrastructure, see the responses in section III-A-3)f)iii) in this chapter of this FSOR.

3)a)iv)2) Fleet Expansion Discouraged

1. **Comment:** Now, then, you go over and you ask, you know, the Governor's office and people on the other side of the street, and they're looking at expanding the industry. But it hurts fleets to expand. If you're a medium fleet, you don't want to become a large fleet. There's no incentive for you to want to grow your company under this regulation. (EUCA7)
2. **Comment:** It's impossible to expand the business if you have to go to the bank all the time. (JANSSON)
3. **Comment:** Our fleet needs to grow in order to keep up with our volume; however, we cannot afford to invest in equipment that is going to be obsolete in just a few years. We cannot afford to buy new equipment and there will be no used equipment on the market that will comply with the new CARB regulations. As a result we will be forced to lay off our work force and downsize/or close our business. (LOUKIANOFF)

Agency Response: We acknowledge that the regulation does discourage the addition of older vehicles, such as Tier 0 and Tier 1 vehicles, into the statewide fleet. This is necessary to achieve emission reductions.

We also acknowledge that, to provide relief for medium and small fleets, the regulation subjects them to less strict provisions than for large fleets. We acknowledge that this may create a disincentive for a small fleet to become medium or a medium fleet to become large, but we believe this disadvantage is outweighed by the advantage of providing relief to medium and small fleets. It is

also important to note that the difference in requirements for medium versus large fleets only exists until 2013, at which time medium and large fleet requirements become identical. Therefore, the disincentive for a medium fleet to become large only exists from 2010 through 2013. The rationale for setting the fleet definitions where there are set is discussed further in the responses in section III-A-6(b)iv) in Chapter III-A-6 of this FSOR.

For additional information on affordability of the regulation, see the response in section III-A-3(a)i) in this chapter of this FSOR.

Upgrading to new vehicles is one compliance option; however, it is not required under the regulation. A fleet may repower with a new engine or replace with a cleaner vehicle, or also install NOx VDECS if available. As stated in the response in section 2(g) in Chapter III-2-A of this FSOR, we do not expect a shortage of used vehicles. Additionally, downsizing a fleet is not the only option if used vehicles are not available to satisfy the turnover requirements of the regulation. Section 2449.1(a)(2)(A)4 of the regulation provides that if a vehicle cannot be repowered or replaced with an equivalent used vehicle, it is exempt from the turnover requirements. Therefore, if used vehicles are not available, a fleet will not be forced to downsize for compliance with the regulation.

3)a)v) Business Leaving the State

- 1. Comment:** It could get to the point where many of us have to close our businesses down and move out of state. (MCCLLAUGHLIN)
- 2. Comment:** Our only business plan will be to start phasing out of state. (CER2)
- 3. Comment:** The regulation will force fleets to move out of state. (MC) (TERRELL1)
- 4. Comment:** This cannot be done without laying off employees and could even result in our company leaving the state or going out of business entirely – which means the loss of many high-wage jobs. (SCOTTR)
- 5. Comment:** The regulation will drive business and employers from the State. (BIA-SD2)
- 6. Comment:** Thousands of owner/operators will be forced out of or into reduced business due to the astronomical costs associated with the replacement or retrofit programs. The dwindling prosperity of Californian businesses will be further forced out of the State. (MCNALLY)
- 7. Comment:** Contractors are going to leave California, and there won't be anyone left to do construction work. Several equipment manufacturers have told us they are worried that a large percentage of the contractors in

California will take this retirement option to its logical conclusion and leave the industry altogether. We are already seeing a demographic trend in this direction. We are hearing of 20 to 40 percent declines in the California contractor base, which makes demographic sense—nearly 50 percent of owners are members of the Baby Boom generation and heading into their retirement years anyway. Because of this regulation, these retirees will simply sell their equipment out of state, rather than pass it along to family members or their employees. When, at some future date, a major earthquake or other disaster strikes and communities want their bridges, buildings and homes rebuilt, they will have wait, wait, wait because of this consequence. (SCCA3)

8. **Comment:** As California struggles to balance its budget and increase revenues, we fear that this regulation will ultimately restrict business and result in some companies choosing to leave the state entirely. (BCL)
9. **Comment:** The regulation will destroy the California construction industry, or drive them out of state. (THARP)

Agency Response: We acknowledge that there are significant costs associated with the regulation, and some fleets may move out of state to avoid paying compliance costs. As discussed in the response in section 3a)j) in this chapter of this FSOR, fleets have many options for complying with the off-road regulation, including relatively low cost compliance options such as vehicle retirement or repowering with a newer engine. There are also early action credits that allow fleets to spread out their costs and avoid the high peaks in annual costs in the early years of the regulation.

Also, as discussed in the responses in section 3)a) in this chapter of the FSOR, we expect the regulation to be affordable for most fleets and do not expect the impact of the regulation for the vast majority of fleets to be enough to force them out of business or out of the state. As discussed in the response in section III-A-3e)vi) of this chapter of this FSOR, many fleets will pass compliance costs onto their customers. We expect that construction fleets will have the ability to bid higher on projects and pay for compliance without significantly affecting the financial situation of their fleet.

Finally, if, as noted by commenter SCCA3, contractors retire because they are of the Baby Boom generation and nearing retirement age, then that would have been likely to happen in the near term even if the regulation had not been adopted.

3)a)vi) Decreasing Fleet Numbers

1. **Comment:** The regulation will lead to firms going out of business because they will have to pay higher prices for newer vehicles. This will result in an overall reduction in the number of businesses operating in the sector, with

concomitant increases in firm concentration in the industry. (CIAQC1)
(CIAQC6) (AGCA3)

2. **Comment:** Because of this regulation, we will see an absolute decline in the fleet numbers. (SCCA3)

Agency Response: We acknowledge that the regulation will force some fleets to acquire newer vehicles than they otherwise normally would and, because of the regulation's costs, may force some fleets to downsize, consolidate or go out of business if they cannot pass through the costs of the regulation. However, we do not expect the regulation to affect the amount of construction performed in the state. Even if some construction fleets do downsize to meet the regulation, we expect that the regulation will not impact the overall amount of construction conducted in the state for a number of reasons. First, construction is by its nature a local business that cannot be outsourced to other state or countries. Second, the cost of the regulation, while significant, is small compared to the annual amount spent on construction in the State each year. As described in Chapter XI of the Technical Support Document, even in the year of maximum cost, the regulation is expected to cost \$568 million which is less than 1 percent of total annual construction valuation (~\$60 billion). Thus, if one fleet downsizes and reduces capacity, another is likely to grow or enter the state to take its place.

3)b) Regulation is Costly

- 1. Comment:** This will affect every construction project from the very beginning, costing both time and money, and making every single project less profitable for the industry, the property owners, and the owners' clients. This guarantees an economic burden of lost profits, storage rental, hiring delays, missed seasonal opportunities, liquid damage penalties, higher sale prices to compensate, and so on. None of this is extraordinary, but is simply to be expected from the nature of the regulation. This is all well beyond any actual purchases. Please keep these common extremes in mind. They will affect every individual in the State regardless of socio-economic status, occupation, or lifestyle, though the disadvantaged, as always, stand to suffer the most. (HCC)
- 2. Comment:** The regulation as currently written clearly does not take into consideration the actual economic effects to contractors in the state of California. (AAWC)
- 3. Comment:** The financial burden on contractors will be astronomical if this regulation becomes effective retroactively. (COADA)
- 4. Comment:** The costs of the regulation are extreme and prohibitive. (FOSTER)
- 5. Comment:** This regulation is not viable from an economic perspective. (FCICI2) (MCCULLOUGH)
- 6. Comment:** An estimated 165,000 pieces of machinery will have to be retrofitted, repowered or replaced over the next 13 years to meet the yearly reduction targets of the regulation. This is financially way out of our feasibility. (PBL)
- 7. Comment:** The economic consequences are excessive and will have a disproportional impact on those required to comply with it. (EUCA1)
- 8. Comment:** We are concerned that the new regulation will require significant costs. (BECKER)
- 9. Comment:** I believe that the regulation is a step in the right direction but possibly a bit aggressive re the costs involved. (SALFEN)
- 10. Comment:** The regulation is a classic "command and control" regulation that will require all construction fleets to meet a strict fleet average emission limit annually. This limit is set for both NOx and PM, and if the fleet does not meet this set limit, it must annually replace, repower or retire 8 % (accelerating to 10% in 2015) of their engines to achieve NOx reductions, and an additional 20% of the engines must be retrofitted with a

verified diesel emission control system (VDECS) trap to reduce PM. This mandatory turnover and retrofitting on an annual basis is extremely costly and financially crippling for many companies. (CIAQC8)

11. Comment: The regulation is not feasible from an economic perspective. It goes far beyond anything that the industry can finance. (PILCONIS)
(AGCA3)

12. Comment: The cost to the industry statewide would be in the billions of dollars. Even if the new generation diesel engines were available in the quantities needed, which they are not, the cost to the industry would be prohibitive. (IUOE2)

13. Comment: We recognize the importance and support the end goals of the regulation. However, the regulation will not only place economic hardships upon the State of California and business it will force us to rely on untested and unproven technologies. Likewise, it will force our members to make large capital investments in equipment we know will not be the cleanest available. (CALCIMA)

14. Comment: Now we are told to scrap or sell our fleets. Well- maintained equipment that has been properly cared for should provide income back to the owner like it was intended when it was purchased. Our businesses run on sound financial principles. Your proposed regulation is not founded on sound financial principles. (DMCI).

15. Comment: We have used ARB fleet calculator to determine what our status will be in order to comply with the regulation. We have sent attachments to show our cost and to show ARB staff how we have arrived at them. We feel that these costs are extreme; our figures are based on real quotes which we have given to ARB staff members. (Camarillo1)

16. Comment: The typical fleet at a cement plant consists of about 35 vehicles, with about 70% of the horsepower hours coming from 10 of those vehicles. The fleet analysis required to identify the optimal compliance plan is complex, and, hence, for illustration purposes, we are presenting a simplified analysis that actually underestimates the projected cost. To comply with the NOx requirements, in addition to natural vehicle turnover rate, it will be necessary to turn over at least one of the ten high-use vehicles in each of the 10 years from 2011 to 2020. Assuming an additional turnover of one vehicle per year, the total cost for the ten-year period will be between \$7.5 million and \$15 million per plant (2007 dollars, without taking into account time value of money), or a total between \$82.5 million and \$165 million for the eleven plants. (MCQUEEN1)
(MCQUEEN2)

17. Comment: The local business' primary concern is the economic impact this regulation could have on them. Under the regulation, the District estimates that newer equipment will require a verified diesel emission control system, with an average cost of \$7,000 - \$30,000. Older equipment may require both repowering and a VDECS, with average costs ranging from \$45,000 - \$90,000. In some cases, owners may have to replace existing equipment in order to fully comply with this regulation. It is the District's experience that many of the local rural fleets own older equipment. (NSAQMD)

18. Comment: The cost of compliance could be as high as \$170 per HP per year over the 21 year regulation. Our analysis based on actual quotes from the Caterpillar Dealer to repower our equipment to Tier 3 engines and add VDECS to the exhaust system will cost from approximately \$45.00 to \$55.00 per HP per year. Our actual operating loss would be \$1 million to \$1.5 million dollars a year under this regulation. (DER1)

19. Comment: For my company's fleet alone, the cost will be in excess of \$400,000 per year. (SR)

20. Comment: For my company's fleet alone, the cost will be in excess of \$300,000 per year. (VC&M)

21. Comment: For my company's fleet alone, the cost will be approximately \$500,000. (MILLER)

22. Comment: We have determined that it will cost our company approximately \$360,000 to comply with the first phase of the regulations. (BCL)

Agency Response: We acknowledge that there are costs associated with the regulation that may be financially significant to fleet owners with affected vehicles. We also acknowledge that some fleets, those that start out with older, dirtier vehicles, will face greater compliance costs than others that start with cleaner vehicles. ARB staff worked throughout the regulation development period to refine the statewide cost estimates, and believe that all costs attributed to the regulation have been accurately estimated, and the effects on the economy and individual fleets have been assessed. The estimates in the Staff Report and Technical Support Document of fleet costs are averages; depending on the actions of an individual fleet, these costs will vary. For additional information on the effects of the regulation on the economy and affected industries, see the responses in sections III-A-3)b)i) and III-A-3)b)ii) in this chapter of this FSOR.

As stated in section A of Chapter XI of the Technical Support Document, ARB recognizes that compliance with the regulation may be financially challenging for

owners of regulated vehicles. Many fleets may have to change how they allocate capital resources, and they may need to borrow money to purchase retrofits and repowers, or to upgrade their vehicles. In addition to the Carl Moyer Program, to minimize the cost-impact of compliance, staff is consulting with other state agencies such as the Pollution Control Financing Authority in the State Treasurer's Office and private lenders to look for ways to leverage existing public programs and funding in the private sector, through potential programs such as government loan guarantees, interest rate buy down programs, etc. We hope these efforts can make compliance with the regulation more affordable and access to capital more widely available. Please see the response in section 6)e)x) of Chapter III-A-6 of this FSOR for a further discussion on potential funding programs.

Commenter CALCIMA noted that the regulation would force them to invest in engines that are not the cleanest available. We acknowledge that in the early years before Tier 4 engines are available, the regulation will push fleets to turn over to Tier 2 and 3 engines. This is necessary to achieve emission reductions before Tier 4 engines become available. Tier 2 and Tier 3 engines/vehicles can be part of a fleet's final compliant fleet, so investments in such Tier 2 and 3 vehicles and engines will not be wasted.

Additionally, commenter DMCI expressed concern that the regulation would require all vehicles in a fleet to be scrapped or sold. Although the regulation requires fleets to gradually turn over their oldest vehicles, a fleet is never required to scrap or sell all of their vehicles at once.

For additional information on compliance costs for the regulation, please see the response in section 3)d)i) in this chapter of this FSOR.

We believe, contrary to the concern noted by commenter IUOE2, that engines and other technologies necessary for compliance will be available in sufficient quantities, and the regulation contains provisions to avoid penalizing affected fleets if there are shortages or delays. For further discussion of this issue, please see the responses in section 2)b) through 2)d) in Chapter 2 of this.

3)b)i) Cost for Industry

- 1. Comment:** The ARB regulation will have a negative impact on our company as well as the health of state's construction industry. (ARTBA1) (ARTBA2) (DUVALL) (EDWARD) (FCICI2) (MALDONADO2) (MARGETT) (MCCULLOUGH) (MILLER) (MLD) (OCBC) (PBL) (SR) (VC&M)
- 2. Comment:** These are people of means, and they aren't going to just lie down and go out of business and go bankrupt. They're not going to do that. So I need ARB to take a fresh look at the economics of this. Can these people stay in business and implement your regulation? If they

can't, it is confiscatory, and we're in a collision course between the taxpayers of this state and the ARB Board. (COSTA)

3. **Comment:** CARB is irresponsible if it makes the off road diesel regulation without a true understanding of the devastating economic impact this regulation will have to the construction industry. (SHAWM1)
4. **Comment:** This regulation is an "Industry Killer". The regulation needs to be reasonable and financially responsible. (MCCLERNON)
5. **Comment:** Due to the time restraints that are being imposed, the negative impact on our company would be overwhelming; to say nothing of the negative impact it would also have on the entire California construction community. (PPC)
6. **Comment:** This regulation will cripple the industry including my business. (KANAYAN)
7. **Comment:** The regulation will have a negative impact on the construction industry. (SKANSKA)
8. **Comment:** All these new regulations will do is cause the cost of future development and construction to reach a point that no one will be able to afford to do business. (AFZAL)
9. **Comment:** I am very much in favor of cleaning up our air and making all sources of pollution cleaner, but this regulation will be an unbearable burden to the construction industry. (MICROWSKI)
10. **Comment:** This regulation can and will have a dramatic impact upon these industries. (SCHULTHESS)
11. **Comment:** ARB's regulation designed to reduce diesel air contaminants will have a significant negative impact on the construction industry. (BES)
12. **Comment:** This regulation will have devastating fiscal effects on one of California's largest industries. (CAR)
13. **Comment:** The regulation will devastate our industry. (ECA)
14. **Comment:** The requirements of the regulation place the financial burden of a largely public benefit exclusively on private contractors. All have a very negative impact on the construction industry. Construction is a low-margin industry. After labor, materials, insurance, fuel and overhead, a very small portion of the \$60 billion spent on construction every year in California is available for fleet upgrades. ARB's regulation goes far beyond

anything that the industry can finance. AGC expects that the regulation will deliver an economically crippling blow to the construction industry.
(AGCA3) (PILCONIS)

- 15. Comment:** Approximately 75 percent of our work is as a subcontractor for heavy highway and general contractors. This regulation will severely affect their ability to prosper and to hire us. In turn, we will not be able to continue to hire and train and employ hazardous material workers, truck drivers, and the necessary support staff, again the majority which are minorities, including approximately 20 women. I implore you to please consider the negative impact this regulation will have on the construction industry. (BRICKLEY)
- 16. Comment:** Contractors will spend billions of dollars to implement the requirements, which costs will be passed on to the customers, who include public agencies, which will then be passed onto the taxpayers. This regulation and its effects will be crippling to the construction industry and to the economy! (GHILOTTIBC)
- 17. Comment:** The regulation will destroy the California construction industry. (THARP)
- 18. Comment:** The cost of compliance for our industry is so high that some large companies are already saying they do not intend to comply. And I can produce names, but I won't. Others will reach the same conclusion when they wake up to this very complex and expensive rule. You must keep in mind our industry has done nothing wrong. The equipment we have operated to build California was never illegal and did not come with a factory emissions warning. (DER7)
- 19. Comment:** The regulation's timeline is both economically and technologically implausible. The demands to meet such hasty deadlines would put a financial strain on the construction industry. (HUFF)
- 20. Comment:** It continues to amaze me that our state, which is in serious financial trouble, would impose yet another "tax" on its citizens. While the regulation is not a direct "tax", it will in fact seriously tax the construction industry, and bring to a halt many construction projects. Both the long term and short term effects of such regulation will cause financial hardship on our industry. Reduced construction activity means reduced profits for construction companies (like mine) and ultimately reduced tax revenues to the state government--which is already in dire straits! (HOBBS)
- 21. Comment:** The regulation is not right for California's contractors or workers. (DD)

22. Comment: The regulation will affect the construction industry as a whole. (HCC)

23. Comment: The new diesel rules are equally non-productive, and would cause hardships in the construction industry field not commensurate with the reduction of green-house gases supposed to be the cause of global warming. (LAZIO)

Agency Response: We do not believe that the regulation requires compliance beyond what the industry can afford. As stated in Chapter X of the Technical Support Document, staff evaluated many alternatives to the regulation. Some of these alternatives contained more stringent turnover and/or retrofitting requirements, and would have achieved greater emissions reductions than those expected by the current regulation. However, staff acknowledged that some of the more stringent proposals would be more than the industry could bear, and therefore developed the regulation in its current form. Additionally, staff had originally proposed that the regulation require 10 percent turnover for NOx BACT compliance; however, after many workshop discussions with affected fleets and industry representatives, this requirement was relaxed to 8 percent turnover for the beginning years of the regulation to reduce the compliance costs for fleets. For a further discussion on affordability, please see the response in section 3)a)i) in this chapter of this FSOR.

Additionally, we expect that many fleets will pass along the costs of compliance to their customers; this would alleviate the compliance cost burden. For more information on passing on the costs, please see the response in section 3)e)vi) in this chapter of this FSOR.

Finally, we recognize that the owners of affected vehicles have done nothing wrong and complied with all laws when buying and operating vehicles. The adoption of the regulation is necessary but does not represent any kind of judgment upon the morality of the affected fleet owners.

24. Comment: Emission levels are projected to decline significantly even without this regulation. As written, the regulation will severely cripple California's construction industry. (J&M)

Agency Response: While staff agrees that NOx and PM emissions are projected to decrease, even in the absence of the regulation, from now through 2020 due to the normal attrition of older engines that are replaced with new engines (which are certified to the increasingly stringent off-road new engine standards), this rate of decline is not sufficient to meet California's emission reduction goals. For additional information on the need for emission reductions from the regulation, please see the response in section III-A-1)b) of Chapter III-A-1 of this FSOR. See also the response in section III-A-6)a)i) of Chapter III-A-6 of this FSOR regarding why the regulating end users of vehicles is necessary.

Finally, we do not believe the regulation will cripple the construction industry; please see the response immediately before this one for further discussion on this point.

3)b)ii) Effects on Economy

- 1. Comment:** The CARB regulation, as currently written, would have a negative impact on California's overall economy. (AGCA1) (ARTBA1) (ARTBA2) (CAR) (DUVALL) (ECA) (ECGEC) (EDWARD) (FCICI2) (GAINES) (MALDONADO2) (MARGETT) (MCCULLOUGH) (MILLER) (MLD) (PBL) (SKANSKA) (SR) (VC&M)
- 2. Comment:** I read that CARB staff expects this regulation to cost an extra 3 billion dollars and possible increase construction costs no more than 5%. I have seen industry estimates of up to 13B dollars. If industry is right construction costs might increase by 20%. This would be devastating to California's economy. (LAMON)
- 3. Comment:** CARB is irresponsible if it makes the off- road diesel regulation without a true understanding of the devastating economic impact this regulation will have to the construction industry and the downstream impact to the state economy. (SHAWM1)
- 4. Comment:** The regulation will harm the California construction economy irreparably. (JOHNSON)
- 5. Comment:** The delays and increase in costs of many of California's construction projects along with the loss of jobs and employment revenue will all result in devastating long term effects on the state's economy. (ACPA)
- 6. Comment:** Creating regulatory hardships on businesses that ultimately cost the loss of jobs will have an immediate effect in several ways. The loss of income tax revenue attributed to construction wages alone will have a substantial impact on the state's overall economy not to mention unemployment costs. (CUSACK)
- 7. Comment:** To me this does not make any sense. The new regulations will wipe out most of my potential employers along with many other California businesses. This will surely cause a snowball effect that will have no end on the California economy. (SIEVERT1)
- 8. Comment:** Many of these companies simply do not have the resources or access to capital to repower or retrofit their engines with little advanced notice and may be forced to park the equipment, ultimately costing jobs and revenue to the state's economy. (ARTBA1)

- 9. Comment:** To meet CARB's objectives in such a short time-frame will cause an enormous impact to the state's economy. (MAY) (NNC)
- 10. Comment:** This regulation is going to cost everyone a fortune. Contractors will spend billions of dollars to implement the requirements, which costs will be passed on to the customers, who include public agencies, which will then be passed onto the taxpayers. This regulation and its effects will be crippling to the construction industry and to the economy! (GHILOTTIBC)
- 11. Comment:** There will be a serious backlash to the California economy as a whole. (BECKER)
- 12. Comment:** [The cost analysis] really just looks at the direct impacts to the construction industry. It doesn't look at the ripple effect to the overall economy. The other issue we have is how far we can go in this state before people can't afford housing and we cause our economy to collapse because we can't simply build housing for the growing population. And it's not just job growth. It's population growth. And if we can't build housing, then we are going to start losing industries and our economy is going to start to decline. Then how are we going to achieve all these other objectives that we have with the environment, having people buy hybrid cars, having people install solar panels, building our transit system, improving our infrastructure so that we can relieve traffic congestion. So there's a lot of potential effects of this, negative effects to our economy, to our environment that we feel really haven't been looked at. (BIA-SD1)
- 13. Comment:** I like to think that I contribute to the state's economy with my small company. If these new regulations are passed without considering small businesses like mine, the state's economy is going downhill. (PBL)
- 14. Comment:** The regulation will put everyone out of business, and workers will lose their jobs. It will destroy our economy. (MCCARTY)
- 15. Comment:** Due to the time restraints that are being imposed, the negative impact on our company would be overwhelming; to say nothing of the negative impact it would also have on the entire California construction community. (PPC)
- 16. Comment:** If contractors big and small just get rid of all their older equipment and buy all new equipment at enormous expense, can you imagine the disruption of commerce to the whole state that this will create? (PB)
- 17. Comment:** To meet CARB's objectives in such a short time-frame will cause an enormous impact to the state's economy. (CRS)

- 18. Comment:** I am confident that this quick fix will come at such a cost to Californians that the economy will take a significant blow. (MCNALLY)
- 19. Comment:** We recognize the importance of clean air for Californians, but we also want to stress how economically devastating your regulations are. (SCOTTB)
- 20. Comment:** If you want to destroy what economy we have left in California, then go ahead and pass the regulation. (LITTEN)
- 21. Comment:** Please do not adopt these restrictive, expensive and unnecessary regulations. Business owners are already at a disadvantage in California due to the high cost of doing business in the state. (FITZGERALD)
- 22. Comment:** If this regulation is approved retroactively, it will have negatively impact on his business and the California economy. The financial burden on contractors and the economy will be astronomical if this regulation becomes effective retroactively. (COADA)
- 23. Comment:** The current regulations will have disastrous effects on all California contractors, and the ripple effect will be felt by all its citizens. (TERRELL1)
- 24. Comment:** I oppose this regulation because it requires additional expenses be levied on an already cash strapped state. (BENTE)
- 25. Comment:** Adoption of the regulation concerning in-use off-road diesel will cripple the state of California as it rebounds from other flawed regulations, like this one, that show no concern for the people of California and have no shred of common sense. (FBA)
- 26. Comment:** The regulation would incur billions in cost to California government, taxpayers and business in an industry that has always pioneered the best available technology in the performance of building a better California and opportunity for all. Our economy can not sustain future governmental burden on monies to replace our failing infrastructure before manufacturing of engine technology has the ability to offer the end user low emission engines. (STIECO1)
- 27. Comment:** The economy is not certain and government imposed costs may even exacerbate the California construction industry with its 268,000 subcontractors. (ASA)
- 28. Comment:** I believe this will collapse California's economy. (HALLETT1)

- 29. Comment:** I fear that this will have a huge negative impact on everyone in our state, as we would see a ripple effect in the form of lost jobs, closed businesses, construction delays-all of which will harm our state's fragile economy. (MICHROWSKI)
- 30. Comment:** This is a huge undue and ill planned regulation for the state. This will dramatically affect the economy as a whole. (DEFOREST)
- 31. Comment:** If employers/contractors have to cut back their fleets or close their doors all together due to the regulations, it will be an extreme hardship on Californians and the California economy. (HYLAND1)
- 32. Comment:** The regulation carries with it significant impact on our economy, and I know of no plan by CARB to provide relief. (MARGET)
- 33. Comment:** A slowing housing market, slowing economy and a regulation that will devastate the net worth of contractors virtually over night has the potential to be an economic disaster. Driving contractors out of business and slowing the economy will achieve the state's overall goal of lowering the amount of particulates in the air in California, but it will also dramatically lower the much needed California tax base. (MCDONALD)
- 34. Comment:** The regulation will result in devastation or closure of many contractors, many of whom are minorities. This in turn will result in dramatic increases in unemployment, reduce the availability of contractors to perform private and public works projects, and most of all, ruin the economy of the state. (ECA)
- 35. Comment:** The regulation will depress the California economy. (EUCA1)
- 36. Comment:** The regulation is bad for CA economy. And what you're going to see is houses increase 50 percent. You're going to see your purchasing power buying freeways decrease. We're in the slump in construction right now. If you were to implement these changes, it will probably spiral into a recession. Its terrible timing. And so, in closing, I think you're going to have less affordable housing, small and disadvantaged contractors going out of business, and people with huge resources, maybe Halliburton, whomever, coming in and raping California for their highway and housing costs. (RMMC2)
- 37. Comment:** Do not jeopardize our economy, public works, schools, hospitals, mass transit, and flood control to create this unquantifiable regulation. (STEICO2)

38. Comment: The effects of regulation will cost the construction industry tens of millions of dollars that will be passed on to taxpayers. California cannot afford to lose the only industry it has left. The construction industry is the backbone of California's economy. (MLIC)

39. Comment: We have several concerns with the regulation as it affects the construction industry as a whole, and the economic stability and health of California above all. (HCC)

40. Comment: The true financial impact of the current PERP and Off Highway Regulation will be much more devastating to both the construction industry and the state economic stability than the state is predicting. (MCDONALD)

41. Comment: The economic consequences are huge. (CBC)

Agency Response: The total annual direct costs associated with the regulation are estimated to be approximately \$568 million in 2010. Accounting for indirect costs, the proposed regulation is expected to reduce California economic output by about \$700 million, personal income by about \$2.3 billion, and employment by about 1,400 from their projected levels in 2010. In the context of the State's economy, the economic impact of the regulation is minor and is not expected to impose a noticeable impact. In addition, staff estimates that the benefits to California of currently adopted air pollution control measures exceed their costs by about three to one; it is expected that a benefit \$18 to \$26 billion in avoided premature death and health costs will occur from this regulation. A full description of the economic impacts of the regulation is located in section G, Chapter XI of the Technical Support Document. Additional information on the benefits of the regulation can be found in section C of Chapter IX of the Technical Support Document.

The LAMON comment mentions industry estimates of the regulation costing up to 13 billion dollars. As explained further in the response in section 3)c) of this chapter of this FSOR, we believe the industry estimate is inaccurate, and that the regulation will cost \$3 to \$3.4 billion.

The PBL comment raises concern regarding the impact of the regulation on small businesses. Many small businesses will be small fleets. As discussed further in the responses in section III-A-6)b)iv) of Chapter III-A-6 of this FSOR, the regulation contains numerous provisions meant to lessen the impact of the regulation on small fleets.

The STEICO comment mentions concerns regarding the regulation's impact on infrastructure. That issue is addressed in the response in section 3)f)iii) in this chapter of this FSOR.

The BIA-SD1 comment mentions concerns regarding the regulation's impact on housing costs. That issue is addressed in the response in section 3)d)xii) in this chapter of this FSOR.

The SHAWM1 comments mentions a concern that ARB does not have an adequate understanding of affected industries. That issue is addressed in the response in section 3)d)iv) in this chapter of this FSOR.

The MCDONALD comment mentions impacts of the regulation on net worth. That issue is addressed in the response in section 3)e)iii) in this chapter of this FSOR.

The RMMC2 comment expressed concern regarding companies like Halliburton coming in and “raping California for their highway and housing costs.” We assume by this comment that that the commenter means large out-of-state firms may benefit from the regulation by gaining an advantage over California firms that will be subject to more compliance costs. The regulation applies equally to out-of-state firms as in-state, so we do not believe it gives such firms an advantage. If anything, the regulation is more strict for out-of-state firms because if they enter the state for the first time after the regulation is in effect, they must meet the fleet average requirements and do not have the option of meeting the BACT requirements. Additionally, this comment also expressed concern that the regulation will cause housing to increase by 50 percent. We disagree, and estimated that if the construction industry’s proportional costs of the regulation were passed through to end users, and all of those costs were borne by housing construction, that the impact could mean that new home construction could increase by about \$1,000 per unit. For an additional discussion on increasing housing costs, please see the response in section 3)d)xii) in this chapter of the FSOR.

For additional information on economic hardship provisions, please see the response in section 3)a)iii) in this chapter of this FSOR.

Please see the response in section 3)g) in this chapter of this FSOR for a discussion on job losses due to the regulation, and section 3)a)i) of this chapter this FSOR for a discussion on affordability of the regulation.

3)b)iii) National Level Impacts

- 1. Comment:** This regulation would detrimentally impact Associated General Contractors of America’s members nationwide. While this proposal is specific to equipment that operates in California, history has shown that other states frequently adopt air quality rules developed in California. (PILCONIS) (AGCA3)

Agency Response: ARB staff is not certain if any other states will adopt all or any sections of the regulation (2449, 2449.1, 2449.2, 2449.3), and therefore staff

cannot evaluate the impacts of a national off-road regulation. Currently, no other state contains as many counties designated as non-attainment for multiple National Ambient Air Quality Standard (NAAQS) pollutants, and therefore, other states may not have the same need for emission reductions that California currently does. To date, no other state thus far has expressed interest in adopting portions of the regulation.

3)b)iv) Low Population County Impacts

- 1. Comment:** Our main concern with the regulation is that the businesses of [Tuolumne] county, as with other rural counties, will face economic hardships due to the costs that will be incurred in complying with the NOx reduction provisions of this regulation. The Board of Supervisors understands the reasons for and supports the diesel PM reduction provisions for the sake of public health. This Board believes that requiring the larger urban counties to comply with this regulation commensurate with their contribution of emissions will sufficiently reduce the lion's share of NOx and PM emissions that are generated. Adding Tuolumne, Mariposa, Calaveras and Amador counties to the Captive Attainment Area Fleet definition and exempting these counties from the NOx Fleet Average and turnover requirements is consistent with the California Clean Air Act and California Health and Safety Code Section 39610, which is intended to place the burden of reducing emissions on those upwind air districts that cause or contribute to ozone violations in the downwind districts.
(TCBS)

Agency Response: As stated in the response in section III-A-6)b)iv)3)c) of Chapter III-A-6 this FSOR, we disagree with extending the "Captive Attainment Area Fleet" definition to include areas that are classified as ozone non-attainment as a result of transport. These areas have been designated by the U.S. EPA as violating the federal 8-hour ozone standard. There are five complete counties that have overwhelming transport impacts: Amador, Calaveras, Mariposa, Nevada, and Tuolumne. There are also two partial counties that meet these same criteria (Riverside and Kern). In some of these areas air quality is getting worse, meaning that these counties have the potential in the future to be designated severe non-attainment for the federal 8-hour ozone standard.

In addition, these counties do not meet the state ambient air quality standard for ozone. The California Clean Air Act (CCAA) requires each air pollution control and air quality management district in which a state ambient air quality standard for ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide is exceeded to develop a plan and an emission control program to attain the standard(s). The CCAA recognizes that ozone and ozone precursors can be carried by winds over long distances and thereby contribute to air quality problems outside the district or air basin where they originated. To address this, the CCAA requires upwind districts to mitigate the impacts on downwind areas of pollutants emitted in the upwind districts. Thus, the districts upwind of the transport-impacted counties

listed above are already required to mitigate their emissions. We believe it also makes sense for the counties themselves to limit their own local emissions because local NOx contributions may add to the severity of the ozone problem. Therefore, we do not support treating these areas as attainment areas.

Of note, however, is that the regulation already contains special provisions meant to limit the financial impact of the regulation on small fleets and medium fleets. For example, small fleets are exempt from all NOx requirements. Additionally, the counties listed above are labeled as rural, low-population counties. This means that all municipal fleets in those counties, regardless of their size, are designated as small fleets, and are exempt from the NOx requirements of the regulation.

Please see also the response in section III-A-3)a)i) of this chapter of the FSOR for a discussion of why we believe regulation will be affordable and not pose an economic hardship for affected fleets.

Please see also the first response in Chapter III-A-1 of this FSOR for a discussion of why emission reductions are beneficial even in rural areas.

3)b)v) Public Agency Costs

1. **Comment:** The regulation will severely impair public agencies. Most public agencies own fleets of off-road diesel equipment used for maintenance work and those projects are not subject to the public contracting requirements. These machines are typically older machines with older engines, many with Tier 0 engines. The regulation requires these engines to replaced, repowered or retired. This expense will use up a large amount of the agency's funds, thus diminishing the budgets that these agencies would otherwise use for capital improvement projects. (EUCA1)
2. **Comment:** As defined by this regulation, the County of Los Angeles Department of Public Works has more than 200 pieces of off-road equipment with a cumulative replacement value of \$40 to \$50 million. Beginning in 2009, this regulation requires Public Works to replace at least ten percent (by horsepower) of its diesel-powered off-road equipment each year through 2020. To comply with this regulation, Public Works will have to budget at least \$4 to \$5 million per year for replacement equipment (more than double its current replacement budget for its off-road equipment). The regulation also requires Public Works to upgrade and/or retrofit twenty percent of its diesel-powered off-road equipment per year. At an average cost of \$20,000 per unit, this will cost Public Works an additional \$800,000 per year. At some point, we know that compliance costs may limit our ability as an agency either to function or to comply with this and other regulations. We ask you to recognize our efforts and intentions and work with us to avoid either of these end results. (GLATKY)

Agency Response: Staff acknowledges that public fleets will incur costs due to the regulation, and that the money spent on complying with the regulation cannot be spent on other items. However, staff does not believe that the costs are as high as indicated by commenter GLATKY. Commenter GLATKY estimated costs based on a requirement for 10 percent per year annual turnover. Although staff had proposed 10 percent annual turnover as part of the NOx BACT requirements in an earlier draft of the regulation, the regulation as proposed in the Staff Report and as adopted includes 8 percent annual turnover through 2016. Therefore the costs quoted are inflated by at least 20 percent, and potentially more depending on if the costs are based on replacement to new vehicles versus considering cleaner, used vehicles or engine repowers.

While the County of Los Angeles would not qualify, we would also like to note for commenter EUCA1 that the regulation includes provisions meant to alleviate the regulation's impact on low-population county municipalities. If a municipality fleet operates in a low population county, that fleet is considered a small fleet, regardless of the total horsepower for that fleet. This means the low-population county municipality is exempt from the regulation's NOx requirements and does not need to comply with the PM requirements until 2015.

3)b)vi) Funds for Other Technologies

1. **Comment:** Putting all of the emphasis on one element of the construction process neglects the fact that technology is driving increased equipment productivity faster than nearly any other area today. The introduction of automatic laser and GPS control systems is changing the face of grading and paving construction. By forcing construction companies to focus the bulk of their resources on cleaner burning engines, CARB is unintentionally reducing the resources available for new technology. These advances such as automatic controls that provide real time job information to the operator in the cab have the potential to significantly increase productivity, cutting emissions dramatically. And, they do so with lower costs to contractors and builders rather than with the higher costs of your proposed regulations. In a world of scarcity, you are simply mandating that resources that are improving industry efficiency today are re-allocated to new diesel engine purchase for designs that do not even exist in the case of Tier Four engines. (AE)

Agency Response: We acknowledge that by requiring investments in cleaner vehicles, the regulation may force fleets to spend less in other areas. However, while improving the efficiency of a vehicle and/or increasing operator productivity may (but not necessarily) result in emission benefits, the benefits achieved from vehicle upgrades, retirements, and exhaust retrofits are certain, and are much greater than those that would be expected from improved productivity. For example, a Level 3 exhaust retrofit, which will be required for many vehicles by the regulation, reduces diesel particulate matter emissions 85 percent. It is

unlikely that any technology aimed at improving productivity would improve productivity (and correspondingly reduce emissions) that dramatically.

Higher tiered vehicles are significantly cleaner, and often more efficient, than their predecessors. Without a doubt, these cleaner engines are necessary to achieve the large emissions reductions needed by California. Information on the benefits of the off-road regulation is located in Chapter IX of the TSD, and the responses in Chapter 1 of this FSOR describe further the need for the regulation. In fact, the regulation will push fleets to accelerate turnover to these higher tier vehicles, many of which incorporate many of the new technologies (such as GPS) mentioned by the commenter.

See also the response in section III-A-2)c)i) in Chapter III-A-2 of this FSOR for a discussion of the availability of Tier 4 engines and vehicles and why staff believes it will be sufficient.

3)b)vii) Cost Falls on One Industry

1. **Comment:** The regulation's cost is unfairly handed down to contractors and unions, and not shared equally by equipment manufacturers. Contractors have to absorb a disproportionate amount of repercussions by this regulation for something that they didn't do. (EUCA6)
2. **Comment:** The requirements of the regulation place the financial burden of a largely public benefit exclusively on private contractors. (PILCONIS) (AGCA3)
3. **Comment:** The costs associated with this regulation are huge: \$3-\$3.4 billion. While CARB's estimates for how much this regulation will save the economy by reductions in hospital visits, lost work days, and early deaths are even larger, CARB is asking one sector of the economy to front all of these costs. (TA)

Agency Response: The commenters are correct to note that the regulation does impose requirements on end users of off-road vehicles. Because of the significant health impacts occurring due to diesel PM and NOx emissions from off-road vehicles, as described in Sections B through D of Chapter I of the Staff Report, further emission reductions beyond those expected from the off-road engine standards are needed. Because of the long actual life of many off-road vehicles, if ARB waited for normal turnover and let the new engines trickle through the fleet, we would forego the health benefits of the regulation for many years. As described in Section A, Chapter IV of the staff report, these health benefits include the prevention of 4,000 premature deaths. A more detailed discussion on why it is necessary to regulate the end user is located in section III-A-6a)i) of Chapter III-A-6 in this FSOR. The responses in that section also describe how equipment manufacturers are already subject to ARB and U.S.

EPA new engine standards and face their own costs to comply with those standards.

While we recognize and understand that affected fleets are concerned about the costs of compliance, it is important to consider the other side of the fairness argument raised by the commenters. Is it fair for the general public, the receptors of diesel PM emissions and ozone exposure, to continue to suffer the harmful effects of such pollution, which include illness, lost workdays, and premature death? Staff does not believe so, and believes that the regulation provides a fair, balanced approach to reducing the harmful effects of air pollution in a manner that imposes a manageable economic burden on affected fleets.

Also, as discussed in Section A of Chapter XI of the Staff Report and described further in the discussion on affordability in section 3)a)i) in this chapter of this FSOR, the BACT annual turnover/retrofitting provisions would allow fleets that start out very dirty or that happen to own very long-lived equipment and who cannot realistically meet the fleet average targets, especially in the early years of implementation, to have an affordable path to compliance.

Additionally, the costs of the regulations are not experienced by private contractors alone. As stated in Chapter V of the TSD, the construction industry represents only 50 percent of the fleets affected by the off-road regulation. Other private industries such as rental companies, the ski industry, and airlines, as well as local, state, and federal government fleets will also have to comply with the regulation.

3)b)viii) True Cost of Regulation

- 1. Comment:** The cost -- the \$3 billion cost, where somebody came up with that number astonishes me. We as the manufacturers in OEM don't even know how much it's going to cost to make those repowers. How can somebody just arbitrarily come up with a \$3 billion number when we're the ones that are going to be putting those engines in those machines and supplying these products? (H-CAT)

Agency Response: As discussed in the response in section 3)d)i) in this chapter of this FSOR and described in detail in Chapter XI of the Technical Support Document, ARB staff did not arbitrarily estimate the statewide costs. The compliance costs for the regulation were developed based on current price estimates for new and used vehicles, engine repowers, and VDECS (hardware, installation, and maintenance). Additionally, staff predicted the compliance paths for over 200 actual fleets in order to estimate the average compliance costs for the statewide fleet. As stated in Chapter III of the Technical Support Document, staff also held dozens of public workshops, workgroups, and private fleet meetings to discuss the costs and compliance options for the regulation. By working with the affected industries, staff believes they have developed a cost estimate that reflects the average statewide costs attributed to the regulation.

3)b)ix) Average Fleet Costs

- 1. Comment:** ARB needs to calculate the cost of the regulation to the “average” small, medium, and large fleet and confirm the ability of such operators to absorb these costs. The assessment needs to include administrative costs, such as labor required to assess and develop compliance plans and comply with record-keeping and reporting requirements, and hardware costs, including hardware, installation labor, maintenance, and replacement. (CBIA)

Agency Response: As presented Chapter XI of the TSD, we calculated the average cost for large, medium, and small fleets to comply with the regulation. For an average medium or large fleet, the costs are expected to be between \$104 and \$117 per horsepower (/hp) for affected vehicles owned by the fleet. For an average small fleet, the costs will be approximately \$73/hp. These compliance cost estimates included the costs for engine retrofit with a VDECS (including installation, necessary maintenance, and associated fuel penalties), purchase (turnover) of a replacement used vehicle or engine, and annual recordkeeping and reporting.

We also addressed the ability of fleets to absorb costs and afford the regulation, as discussed further in the responses in section III-A-3)a) of this chapter of this FSOR.

3)b)x) Cost of Enforcement

- 1. Comment:** I am also concerned that the regulation is so complex that it would take an army of CARB enforcement/auditing staff to verify compliance. The cost of enforcing this regulation is another element that needs to be quantified. (CBIA)

Agency Response: Staff agrees that enforcement costs should be quantified, and ARB staff was required to submit an Economic and Fiscal Impact Statement that was approved by the Executive Officer of ARB, the Secretary of the California Environmental Protection Agency, as well as a program budget manager at the California Department of Finance. This Statement outlined all costs incurred by the off-road regulation, including the costs to the state for additional enforcement officers. Although these costs were not listed in the off-road Staff Report, they were quantified.

As acknowledged in Chapter X of the Staff Report and discussed further in Chapter 11 of this FSOR, ARB is adding additional staff to implement and enforce the regulation.

3)b)xi) Reductions in Vendor Businesses

- Comment:** The ARB has not taken into account the business that will be taken away from vendors due to this regulation. (RRPI2)

Agency Response: The commenter's statement is not correct. Staff have considered potential impacts on vendors, and have concluded that we do not anticipate that vendors will lose business due to the regulation. Many fleets will have to purchase new or used equipment, repower their vehicles with new engines, and install exhaust retrofits to comply with the regulation. In addition, fleets will need to continue to properly maintain their off-road vehicles. Although some fleets may choose to downsize their total horsepower, it is not expected that the total amount of off-road vehicles in the state will decrease. Accordingly, there should be no decrease in the number of vendors in the state who service, sell, maintain or retrofit these vehicles.

Additionally, staff believes that the regulation will spur growth in the off-road exhaust retrofit industry. This new industry is currently experiencing rapid growth as it prepares for the increasing demand for exhaust retrofit devices. This growth is adding to the total number of vendors that are servicing the off-road vehicle population.

See also the response in section 3)b)xv) in this chapter of this FSOR regarding why staff does not believe the regulation will reduce business for used equipment/vehicle dealers.

3)b)xii) Lack of Compliant Equipment

- Comment:** Due to the major cost of retrofitting, repowering, or replacing equipment, ARB's regulation is likely to cause a shortage of compliant equipment available for construction projects. (AGCA3)
- Comment:** Due to the major cost of replacing, retrofitting or repowering equipment, it is reasonable to expect that the proposed regulation will cause a shortage of compliant equipment to be available for residential, commercial, industrial and institutional projects. These shortages will be particularly acute during initial implementation of the regulation from 2007 through 2015. These years are also critical for implementing regionally significant transportation projects, 4 bond-funded congestion relief projects, and Transportation Control Measures that would provide emission reductions to reach attainment of the PM 2.5 standard in 2015. A shortage of compliant construction equipment will result in fewer emission reductions and benefits than assumed in regional air quality management plans. (CIAQC7)

Agency Response: We disagree. See the following responses in Chapter III-A-2 of this FSOR for a discussion of why we believe there will be adequate

availability of repowers (section 2)b)), new vehicles (section 2)c)), and used vehicles (section 2)g)) for fleets to comply with the regulation.

As discussed in Chapter XI of the Technical Support Document, as well as section 3)d)i in this chapter of this FSOR, the regulation is flexible, and allows each fleet to determine its own compliance path, each with a varying cost. Although some fleets may shrink to comply with the regulation, as shown in Chapter VI of the TSD, the total horsepower of the statewide fleet is expected to continually grow. With this expected growth, we do not expect that there will be a shortage of contractors, or equipment, to perform necessary construction projects.

See also the response in section 12)a) in Chapter III-A-12 of this FSOR for a discussion regarding why we do not believe a shortage of compliant equipment will cause emissions disbenefits. Finally, see the response in section 3)f)iv) of this chapter of this FSOR for a discussion of the regulation's effect on the infrastructure bonds.

3)b)xiii) Front Loaded Costs

- 1. Comment:** Costs are not spread evenly across years, but instead will require many operators to spend significant capital in the first several years of compliance. From 2009-2011, we project capital expenditures at a rate that is approximately 25% higher than the remaining period of rule compliance. (STODDARD)
- 2. Comment:** The biggest help for a company like ours would be to ease up on the front-end of the Draconian schedule that you're proposing, thereby giving us a more viable time frame to absorb the hit and giving us a better chance to spread out our costs so that we can sustain our company and the livelihood of our employees. (CARDE)

Agency Response: We acknowledge that many fleets will experience the highest annual compliance costs in the first few years of the regulation's implementation (2010-2012). However, certain actions under the regulation could serve to substantially mitigate these costs. For instance, certain actions taken by fleets prior to their initial compliance date (such as retrofitting and repowering) will allow them to accrue carryover credits, which can apply towards the NOx and PM BACT requirements in the beginning years. These early compliance actions can save fleets money, help them spread out their compliance costs, and avoid the substantially reduce the early peak in annual compliance costs. Additionally, new section 2449.2(a)(2)(A)1.b. allows a fleet with shrinking horsepower to retire Tier 0 vehicles to gain exhaust retrofit credit. This provision will help older fleets in the beginning years if they cannot afford to meet the PM and NOx BACT requirements.

However, implementation of the regulation cannot be delayed. Staff analyses have found that a five year delay of the NOx and PM targets would result in a loss of 70 percent of the NOx emission benefits and 72 percent of the PM emission benefits through 2020. Also, delaying the regulation and instead relying on natural turnover and existing incentive programs would do nothing to meet the State's required emission reduction commitments for 2014 under the State Implementation Plan. In addition, a substantial loss of emissions benefits such as this translates into hundreds of lives not saved over the course of the regulation.

3)b)xiv) Cumulative Cost Impacts

- 1. Comment:** ARB must consider not merely the immediate impact of ARB's proposed rule on the construction industry but also the cumulative burdens of other requirements that the industry must meet. Accordingly, ARB must consider the costs of compliance with other ARB rules for other equipment (e.g., portable equipment, on-road equipment) in the same timeframe. (PILCONIS) (AGCA3)
- 2. Comment:** Please keep in mind that these same contractors are subject to the stationary, portable, and upcoming on-road measures. Each of these measures has unique requirements resulting in further confusion and a growing cumulative economic burden to the folks that build our roads, bridges, buildings, and homes. (BUCKANTZ)
- 3. Comment:** CARB has not considered the cumulative impacts of the series of regulations affecting the construction industry - Construction companies are now faced with requirements to replace their portable equipment, their off-road equipment, as well as their on-road trucks and their spark ignited equipment beginning later this year. Any one of those rules is expensive. Combined they make staying in business impossible for many contractors. Those impacts have not been included in CARB's analysis of the economic and environmental impacts of the proposed regulation. (CIAQC7)
- 4. Comment:** Add to this regulation the already existing PERP program as well as the soon to come on-road in use diesel regulation. We own all categories of equipment. When all three of these regulations are passed and running concurrently, we will be in real trouble. (FCICI1)
- 5. Comment:** The ECA would also request that the CARB Board realize that this regulation is only one of three or more regulations that are facing the construction industry. The Portable Equipment Registration Program (PERP) regulation, the On-Road regulation, and Off-road regulation are costly on their own. The financial ramifications of these regulations combined will, without a doubt, kill the construction industry in California. (ECA)

- 6. Comment:** I cannot afford to purchase all the equipment to comply with the off-road and other regulations combined. (MARTIN)
- 7. Comment:** The upcoming on-road rule will be a compounding expense on top of the proposed off-road regulation. (DCCI) (STOWE1)
- 8. Comment:** NWS is requesting the Board members to direct the CARB staff to work with industry to develop a cumulative costs analysis for the Portable ATCM, Off-road ATCM and the On-road ATCM at the completion of the On-road ATCM. (NWS)
- 9. Comment:** ARB is looking at a 2010, 2009 and 2010 deadline at this same time that the portable engine rule, all those Tier 0s have to go away. So you're double-dinging the same industry to clean up the emissions. And I just think it needs to be noted. (EUCA7)
- 10. Comment:** ARB has already passed the portable equipment registration program which will be putting an additional burden on the construction industry. (SACBES)

Agency Response: We are aware that many fleets will be subject to other regulations, such as the portable equipment ATCM, and the off-road regulation. However, for fleets subject to the off-road regulation, we do not expect that the portable equipment ATCM would add significant costs.

We do not have adequate survey data from fleets to know how much portable equipment is owned by fleets also affected by the off-road regulation. However, as stated in the Staff Report for the portable equipment ATCM, the total cost of the portable equipment ATCM is expected to be only \$15 million per year. As stated in the off-road Staff Report, the off-road regulation will cost approximately \$243 million per year on average. Thus, even if all portable equipment covered by the portable equipment ATCM were owned by fleets also affected by the off-road regulation (which is clearly not the case), the cumulative costs from the portable ATCM would add only 6 percent to the costs faced by off-road fleets.

In addition, staff expects that some of the regulatory costs experienced by affected fleets can be passed on to their customers, alleviating some of the potential costs. A more detailed discussion of passing on costs can be found in the response in section 3)e)vi) in this chapter of this FSOR

The on-road regulation for private trucks and buses is currently in the proposal phase, and will not be presented to the Board until late 2008. Because this regulation has not been formally adopted, staff could not estimate the proposed cumulative impacts of the on- and off-road regulation. Staff will urge those

developing the on-road regulation to evaluate the cumulative impacts of their regulation in conjunction with other regulations currently in effect.

For a more detailed discussion of affordability, see the response in section 3)a) of this chapter of this FSOR.

3)b)xv) Destroys Used Vehicle and Rental Markets

- 1. Comment:** Very productive equipment will be forced to an early retirement, thereby affecting the construction companies as well as used equipment values. It will make productive equipment obsolete and worthless and destroys the used equipment market. (OSE)
- 2. Comment:** What we're finding already, even without the regulation being implemented, is that buyers are already not coming to the sale. I had one buyer in Bakersfield tell me, "What's the point? If I buy a piece from you, I'm going to have to replace the engine anyway. So unless you're selling Tier 2 or Tier 3 engines, there's no reason to go, because I'm going to have to spend money on it." One tenet of our industry is more buyers bring more sales. And if you remove the California buyers, that's two-thirds of the people that come to our sales. There's beginning to be a decrease in the dollars, and we're already seeing that. As an example right now, because of the housing market, we've seen a slowdown in large scrapers. Yes, scrapers get sold in Australia. Yes, scrapers are used in the Middle East. We do sell them worldwide. We also sell them in Arizona. But there are a lot of buyers in Arizona that are anticipating when this regulation goes through, that Arizona's going to have a similar one. So they've already changed their buying patterns as well. (RB2)

Agency Response: Although we acknowledge that the regulation will force the accelerated turnover of some relatively dirty vehicles that are currently operating, we do not agree that the regulation will destroy the used equipment/vehicle market. As stated in the response in section 3)f)i) in this chapter of this FSOR, the demand for new equipment is not expected to increase dramatically; however, the number of clean, used vehicles needed for compliance may increase the need for used vehicles. Additionally, as presented by staff at the May 25, 2007, Board meeting, a fleet does not need all Tier 4 and Tier 4 Interim vehicles to comply with the final requirements of the regulation; a fleet can comply on the final compliance date with a mix of Tier 2, Tier 3, and Tier 4. Therefore, it is expected that there will be a demand for newer used vehicles to comply with the off-road regulation and that – if anything – the used vehicle market may be spurred by the regulation.

- 3. Comment:** Our homegrown equipment rental firms who patiently built their inventories with reconditioned used equipment will be forced to drastically reduce their fleets at just the time when contractors are going to need access to rentals the most. Even the national and dealer-based

rental houses are going to be impacted. They normally have the newest equipment, but depend on their ability to sell older machines out the back door for much of their operating capital. That door will be closed because no one will buy a non-compliant machine and everybody is waiting for Tier 4 technology, which is ultimately required to meet the target. (SCCA3)

Agency Response: Although we acknowledge that rental fleets will face costs to comply with the regulation, we disagree that the regulation will force rental fleets to drastically reduce their fleet size. We also do not believe that demand for non-Tier 4 vehicles, other than Tier 0 and perhaps Tier 1 vehicles, will decline. . As noted in the response immediately prior to this one, a fleet does not need all Tier 4 and Tier 4 Interim vehicles to comply with the final requirements of the regulation; a fleet can comply on the final compliance date with a mix of Tier 2, Tier 3, and Tier 4.

Most rental companies are comprised of newer vehicles, and most new vehicles are exempt from many of the performance requirements in the regulation. For example, if a vehicle is less than 10 years old, it is exempt from all turnover requirements, and if less than 5 years old, it is also exempt from the exhaust retrofit requirements. Therefore, the newer rental fleets will need to take few actions to comply with the off-road regulation. Fleets that choose to reduce their horsepower to comply with the regulation may find themselves in need of additional horsepower for certain jobs, and many may rent equipment to fulfill their additional horsepower needs.

Even older, dirtier rental fleets may benefit from the demand for their vehicles created by the regulation. The regulation does not require fleets to account for short-term rental vehicles in their fleet averages and so most fleets will not be sensitive to the cleanliness of the vehicles they rent. This will give older, dirtier rental fleets time to gradually turn over to cleaner vehicles as they comply with the regulation.

The effect of the regulation on rental rates is discussed in the response in section 3)f)v in this chapter of the FSOR.

3)b)xvi) Fines

- Comment:** CARB would impose a \$5,000 to \$25,000 fine for each engine that is in violation of the regulations. Clearly the regulation will have a devastating impact on California's construction companies which employ nearly one million citizens in the Golden State. (ANDERSON1)

Agency Response: Staff acknowledges that the fines for violations of ARB regulations, including this regulation, are intentionally costly. The intent of these fines is to ensure that the cost of non-compliance outweighs the cost of compliance. These fines, like those for all ARB regulations, are established by the Legislature and are spelled out in statute in the Health and Safety Code. At

their maximum, fines can be as high as \$40,000 per vehicle per day for a fleet operator who knowingly fails to take corrective action under the PM portion of the regulation, and/or \$500 per vehicle per day for a violation of the NOx portion of the regulation. Therefore, ARB staff encourages fleet owners to comply with the regulation and avoid the costly fines given for non-compliant vehicles.

Please see the response in section 3(b)(i) in this Chapter of this FSOR for a discussion of the regulation's impact on the construction industry.

3)c) Industry Estimate Cost Discrepancy

One stakeholder group, the Construction Industry Air Quality Coalition (CIAQC), hired a consultant, M Cubed Technologies (M Cubed), to critique staff's estimate of the cost of the regulation and to prepare their own estimate. M Cubed prepared several versions of their analysis, including one presented in May 2007 and one presented in July 2007. The comments related to the results of these two versions of the M Cubed cost estimate are included below under the headers, May Statewide Cost Estimate and July Statewide Cost Estimate.

The M Cubed analysis made a number of assumptions different from those made by staff. The differences between the M Cubed analysis and staff's analysis are grouped into the following categories below:

Modeling turnover/retrofitting requirements,
Modeling vehicle replacement,
Future replacement cycles,
Exhaust retrofit costs and feasibility,
Costs beyond 2020,
Retirement rate,
New equipment costs/availability,
Repower feasibility, and
Discount rate.

Staff's response is presented after the comments and is organized into these same categories.

May Statewide Cost Estimate:

- Comment:** The Construction Industry Cost Model (CICM) uses a statewide basis for estimating costs rather than building up from individual fleets as the ARB Staff model does...The CICM was first run using the proposed regulations and the ARB Staff's data assumptions. The total net present value cost of the current regulatory proposal is \$6.0 billion over the 2009 to 2020 period, an amount twice the \$3.0 to \$3.4 billion for 2009 to 2030 reported in the Staff's report. The annual cost over the 2009 to 2020 period is \$699 million or about \$276 per horsepower. Using 60% higher new equipment prices, a 75% lower proportion of the fleet that can be repowered and a 50% lower normal retirement rate—within

documented industry experience and consistent with U.S. EPA analyses—the total net present value cost rises to \$13.5 billion and the annual cost to \$1.58 billion. This is equivalent to \$623 per horsepower. This is an increase of 125% over the Staff estimate. (CIAQC1)

July Statewide Cost Estimate:

2. **Comment:** Using the staff analysis for turnover and retrofit rates and extending our cost estimates out to 2030, we revised our estimate and found that the costs were about 3.9 to \$5.1 billion. With our own assumptions, we came up with an estimate of about \$12.9 billion over that 21-year period. For comparison purposes, our original estimate had been out to 2020 and our cost estimate for that period was \$9.5 billion. (CIAQC10)
3. **Comment:** The total net present value cost of the current regulatory proposal using the ARB Staff assumptions is \$3.9 billion over the 2009 to 2030 period, compared to the \$3.0 to \$3.4 billion for 2009 to 2030 reported in the Staff's report. (CIAQC6) (AGCA3)
4. **Comment:** The first scenario shows the results using the ARB Staff's assumptions. The second corrects the vehicle market as a surrogate measure and reduces the proportion of equipment larger than 250 hp that might be repowered to 25%. This increases costs by \$3.5 billion or 91%. The third corrects the underlying turnover rate, reducing it from 6.2% to 3.7%. This increases costs by \$2.6 billion or 66%. The final scenario combines these factors to present a corrected overall cost estimate of \$12.9 billion. This is 232% higher than the analysis using the ARB Staff assumptions. (CIAQC6) (AGCA3)

Modeling Turnover/Retrofitting Requirements:

5. **Comment:** The model's premise is that most if not all firms will need to turn over their fleets at the turnover cap rate to comply with the rule. This is based on preliminary analysis of several private fleets, including newer ones, carried out by CIAQC members. (CIAQC1) (CIAQC6) (AGCA3)
6. **Comment:** We assume that no firms can comply with the fleet emission standards and must instead meet the turnover cap. This is an outer bound assumption, but we do not have sufficient information from the ARB Staff to derive a more refined estimate. (CIAQC1)

Modeling Vehicle Replacement:

7. **Comment:** The accelerated purchase of a new machines leads to a chain of transactions that net to the purchase of a new piece equipment. For

example, the sequence would occur as follows for one such regulation-induced purchase:

- Firm A buys a new Tier 3 scraper for \$1 million to comply and sells its older Tier 2 scraper for \$500,000.
- Firm B buys Firm A's Tier 2 scraper to comply and sells its Tier 1 for \$250,000.
- Firm C buys Firm B's Tier 1 scraper to comply and sells its Tier 0 for \$50,000.
- Finally, Firm D buys Firm C's Tier 0 scraper and retires its older Tier 0 for a nominal salvage value.

Tracing through this sequence we see the total net cost across all of the fleets is \$1,000,000 minus a nominal salvage value. Thus, the replacement cost from a statewide perspective is essentially the full cost of a new machine. (CIAQC1)

8. **Comment:** Rather than trying to trace through every transaction by individual firms, the CICM assesses the difference between the “first” and “last” transactions in the compliance sequence triggered by the regulation. This difference represents the incremental equipment additions that must occur to decrease the number of Tier 0 and 1 vehicles and replace them with Tier 2, 3 and 4 ones. We do not assume that all turnover actions require purchase of a new piece of equipment—we simply ignore used market transactions because the net effect has little or no impact on statewide costs. (CIAQC6) (AGCA3)
9. **Comment:** An important difference with the ARB Staff model reflects that use of a statewide perspective instead of individual fleets. The ARB Staff assumes that an individual fleet owner can recoup some of the replacement costs by selling the older piece of equipment. However, this logic does not hold when applying to the statewide fleet. The accelerated purchase of a new machine leads to a chain of transactions that net to the purchase of a new piece of equipment. (CIAQC6) (AGCA3)

Future Replacement Cycles:

10. **Comment:** The CICM reflects the costs of complying by replacement, repowering and/or retrofitting. The replacement costs are computed as the difference between (1) replacing a machine over three replacement cycles without the regulation and (2) shifting the three replacement cycles forward by the expected remaining life that the machine would have had if it was not retired prematurely due to the regulation. Thus, replacing older machines is less expensive than replacing newer ones. (CIAQC6) (AGCA3)

Exhaust Retrofit Costs and Feasibility:

- 11. Comment:** Substantial uncertainty exists over retrofit costs and how those may change over time. The CICM May statewide cost estimate uses \$63 per horsepower for the ARB Staff base case using the Level 3 controls for 175 to 400 HP engines. (CIAQC1)
- 12. Comment:** There are several ‘decision rules’ embedded in the CICM. Two significant rules are that retrofits will only be on equipment less than 150 hp and repowers only for equipment greater than 150 hp. (CIAQC1)
- 13. Comment:** Substantial uncertainty exists over retrofit costs and how those may change over time. The CICM July statewide cost estimate uses \$84 per horsepower for the ARB Staff base case using the Level 3 controls for 175 to 400 HP engines. (CIAQC6) (AGCA3)

Costs Beyond 2020:

- 14. Comment:** The underlying analytical tool of this study is the Construction Industry Cost Model (CICM), an Excel spreadsheet model of fleet evolution from 2008 thru 2020 and associated incremental costs accrued to the construction industry as it complies with the proposed ARB rule. We focus on this period because this is the one in which the proposed regulation has its most significant impact. If the analysis is extended to 2030 to match the latest ARB Staff analysis, the total cost would increase commensurately and significantly, although the annualized costs may decrease. (CIAQC1)
- 15. Comment:** The ARB Staff assumes the costs can be spread over a 21-year period, beyond the end of the regulation period, while we are looking at the 11-year period directly addressed by the regulation. In addition, we have not estimated the added costs beyond 2020. Even so, these costs are still subject to substantial uncertainty about other factors previously discussed, as well as uncertainty about future technology availability and costs. (CIAQC1)

Retirement Rate:

- 16. Comment:** Whereas EPA suggests normal retirement rates of 3% per year, we derived from average annual retirement rate using survivorship rates provided by ARB of 4.45%. The ARB retirement rate does not differ by horsepower despite industry experience that large machines tend to last longer. A scenario was run using an underlying 3% retirement rate. (CIAQC1)

17. Comment: Using the state construction industry gross state product and the emission inventory we were able to estimate the actual annual sales growth and equipment retirement rates that match the total equipment inventory used by the Staff. With a sales growth rate of 2.6%, which matches a 1.95% growth rate in the fleet size, the equipment turnover rate is 3.7% with total sales of 10,114 vehicles in 2010. This turnover rate is 40% lower than that used by the Staff. (CIAQC6) (AGCA3)

18. Comment: The Staff's estimate of the rate at which equipment normally is retired requires that the new equipment market be 50% larger than what historic sales data indicates. Correcting this and one other unsubstantiated assumptions more than triples the estimated costs to the construction industry from the proposed regulation. (CIAQC6) (AGCA3)

New Equipment Costs/Availability:

19. Comment: The ARB Staff estimated resale prices from two auction house websites. However, a comparison of the ARB's new machine prices was made with three new equipment price lists compiled by CIAQC members. The firms' reported prices averaged 55% to 65% higher than the ARB Staff estimates, according to the May M Cubed statewide cost estimate. Scenarios were run with new machine prices 60% higher than the Staff estimates. (CIAQC1)

20. Comment: To assist Dr. McCann with this effort, I gathered new vehicle (equipment) replacement pricing data for the individual fleets of three CIAQC member contractor companies. (CIAQC6) (AGCA3)

21. Comment: The Staff's analysis shows a substantial increase in Tier 3 and 4 equipment in the future, but does not account for how many vehicles can come from the used market when they have not even been yet introduced. The only logical assumption can be that these will be new equipment. Given that, the Staff's price estimates are inconsistent with dealer quotes supplied to CIAQC. (CIAQC6) (AGCA3)

22. Comment: The ARB Staff estimated resale prices from two auction house websites. However, a comparison of the ARB's new machine prices was made with three new equipment price lists compiled by CIAQC members. The firms' reported prices averaged 67% to 78% higher than the ARB Staff estimates, according to the July M Cubed statewide cost estimate. Scenarios were run with the new machine prices 67% higher than the Staff estimates. (CIAQC6) (AGCA3)

Repower Feasibility:

23. Comment: Only a portion of the fleet can be converted. Based on an optimistic assessment, scenarios used in CICM's analysis included an assumption that 25% of the fleet could be repowered. Existing data indicated that the actual rate may be substantially lower. (CIAQC1)

24. Comment: The CICM analysis used 25% as being able to be repowered as representative. For the ARB Staff base case presented here, the analysis used 100% repowering as the representative option, although a much smaller proportion was actually repowered. (CIAQC6) (AGCA3)

Discount Rate:

25. Comment: The discount rate is always an influential parameter, especially when costs or benefits occur far in the future. We used a real discount rate of 4.5% in the May M Cubed statewide cost estimate to reflect the lack of inflation adjustments in the CICM model...We cannot determine from the ARB Staff Report as to whether the underlying cost assumptions were properly escalated for inflation over the study period. (CIAQC1)

26. Comment: The discount rate is always an influential parameter, especially when costs or benefits occur far in the future. We used a discount rate of 7% in the July M Cubed statewide cost estimate consistent with the Staff analysis. However, the Staff has not documented whether that rate is nominal or real. If it is nominal, then the real rate should be 4.5% and the projected costs would rise commensurately. (CIAQC6) (AGCA3)

Agency Responses:

May and July Statewide Cost Estimates:

On May 23, 2007, M Cubed (on behalf of the Construction Industry Air Quality Coalition, or CIAQC) released an economic analysis of the off-road regulation based on their own economic model, the Construction Industry Cost Model (CICM). In this analysis, it was stated that the actual cost of the ARB proposal was \$6 to \$13 billion (over 2010 to 2020), and not \$3 to \$3.4 billion (over 2009 to 2030) as estimated by ARB staff. M Cubed claimed that when using the same economic modeling assumptions as ARB staff, the actual regulatory cost would be approximately \$6 billion (over 2009 to 2020). Additionally, M Cubed asserted that if more realistic assumptions were used, a cost of \$13 billion (over 2009 to 2020) would result. In evaluating the methodology used by M Cubed, compared to that used by ARB, staff concluded that M Cubed made unrealistic assumptions on many key inputs to inflate the cost estimates to \$6 billion. In summary, M Cubed's analysis:

- Unrealistically assumed all fleets must do the maximum turnover and retrofitting each year (untrue for an estimated 95 percent of fleets);

- Incorrectly assumed that all fleets in the state would face the same turnover/retrofit costs as those for older fleets;
- Based turnover costs on assuming all existing vehicles become worthless, and that new vehicles are purchased for compliance with the regulation;
- Inappropriately inflated the price and number of high-cost retrofit systems;
- Arbitrarily assumed PM retrofits would not be used on engines greater than 150 hp and thus engines greater than 150 hp would have to turn over to reduce PM; and
- Assumed all costs were consolidated to years 2009 to 2020.

After discussions with M Cubed and CIAQC, M Cubed released a revised version of CICM in July 2007. This new model corrected some of previous discrepancies, and estimated a statewide cost of \$3.89 billion over the 2009 to 2030 period.

Although the estimate from the July CICM was closer to the results from the ARB staff economic analysis, ARB staff believed the M Cubed estimated costs were still unrealistically high. In summary, the July CICM:

- Unrealistically assumed all fleets must do the maximum turnover and retrofitting each year (untrue for most fleets);
- Incorrectly assumed that all fleets in the state would face the same turnover/retrofit costs as those for older fleets;
- Based turnover costs on assuming all existing vehicles become worthless, and that new vehicles are purchased for compliance with the regulation;
- Inappropriately inflated the price and number of high-cost retrofit systems; and
- Attributed the costs of advancing three purchase cycles to the regulation (i.e., the cost not just of replacing one vehicle, but instead the cost of buying a vehicle earlier than normal, and then at the end of that new vehicle's useful life, buying another vehicle earlier, and then at the end of that second new vehicle's useful life, buying a third vehicle earlier).

When M Cubed calculated an estimate of approximately \$13 billion in total costs, they changed an additional three key modeling parameters that added further inaccuracies and greatly inflated costs. For this higher cost analysis, M Cubed assumed:

- A normal vehicle retirement rate 40 to 50 percent lower than the rate used by ARB in its calculations. As described in the response to comment 4(e) in Chapter 4 of this FSOR, the normal turnover rate used by ARB is a reasonable estimate reflecting the best data currently available and is in fact somewhat lower than the normal turnover assumed by U.S. EPA;
- 60 to 67 percent higher new equipment prices; and
- 75 percent lower proportion of the fleet that can be repowered.

Staff held a workgroup meeting to present and discuss staff's methodology for estimating cost of the regulation on June 18, 2007, and to go over each of the

differences between staff's analysis and M Cubed's analysis. As discussed in Chapter 10 of this FSOR, the ARB economic model is not very sensitive to various perturbations of the parameters where ARB and industry disagree. Staff stands behind its economic analysis, and believes that the model presented by M Cubed presents a gross overestimate of the total statewide costs based on a series of assumptions that are clearly flawed.

Additional details regarding the sensitivities of the ARB and M Cubed cost models can be found in Chapter III-A-10 of the FSOR.

Each assumption (for both the May and July CICM analysis) is discussed in detail in the responses below.

Modeling Turnover/Retrofitting Requirements:

M Cubed assumed that no fleet would ever meet the PM and NOx fleet averages, and therefore, the maximum turnover and retrofit requirements were assumed each year. However, as discussed in Chapter 11 of the Technical Support Document, ARB staff analysis of actual individual vehicle data from 200 private and public fleets indicates that many fleets would meet the fleet targets in the early years of the regulation, and that approximately 95 percent of fleets are estimated to meet fleet targets before the end of the regulation. In addition, by assuming that the statewide fleet must do the maximum amount of turnover and/or retrofitting per year, it is assuming that California is comprised of only older, dirtier fleets. As shown in Chapter 11 of the Technical Support Document, as the age of the fleet increases, the compliance costs also increase. Therefore, fleets with older vehicles will have the highest compliance costs. By assuming that the maximum turnover/retrofitting will take place each year, the highest compliance costs of the oldest, dirtiest fleets are being modeled for all vehicles in the statewide fleet, and would produce a gross overestimation of the statewide costs.

Modeling Vehicle Replacement:

The M Cubed "chain of transactions that net to the purchase of a new piece equipment" methodology incorrectly assumes that California is a closed market, i.e. vehicles in California will never leave or enter the national or world market. M Cubed cites the "need to do the analysis not from the perspective of a single firm, as the Staff has done, but rather by tracing transactions involving a single vehicle. Only this way can it be determined when a vehicle actually leaves the fleet." However, according to references cited in the Technical Support Document, California represents only 11 percent of the national equipment market, and to assume that no vehicles enter or exit the state is incorrect.

The "chain of transactions" method implicitly assumes that the increased turnover activity due to the rule will be the same among the various aged fleets, i.e. older

fleets will not experience an incremental turnover any greater than a new fleet. This is false, as discussed further below.

As modeled by staff, under the rule, the majority of new vehicles entering the statewide fleet would be purchased in the course of normal business by the very youngest, cleaner fleets. Staff modeling showed that fleets from zero to four years of age would not incur any incremental increase in turnover or retrofit due to the rule; all of the new vehicles purchased by these fleets would be purchased in the normal course of business (therefore the cost of these new vehicles is not attributable to the rule). Fleets of four to eight years average age would have a slight incremental increase under the rule in the purchase of new vehicles.

As discussed in Appendix H of the Technical Support Document, staff modeled under the regulation fleets of eight to twelve years of age purchasing one-year-old used vehicles; 12 to 16 year old fleets purchasing used 2-year-old vehicles, 16 to 20 year old fleets purchasing used 3-year-old vehicles, and 20 year old and greater fleets purchasing used 4-year-old vehicles.

As logic would dictate, the older, dirtier fleets will have a greater incremental increase under the rule in turnover and retrofit than the newer, cleaner fleets. The M Cubed “chain of transactions” is unable to capture the differing incremental increase in turnover and retrofit of various age fleets and the differing costs associated with purchasing different age used vehicles. Instead, the “chain of transactions” explicitly assumes for the cost of every used vehicle there is the cost of a new vehicle attributable to the rule. The net result of M Cubed assuming an artificial closed system is to make the regulation appear to be much more expensive than we actually expect it will be.

The M Cubed analysis assumes that there is effectively no resale value in selling any used equipment. Many vehicles (especially Tier 0 and Tier 1 vehicles) will have to be sold out of state to meet the requirements of the regulation, and therefore, those fleets will gain more than a nominal salvage value for their vehicles. This additional income will lower a fleet's cost to comply with the off-road regulation, and will therefore lower the total cost of the off-road regulation. By assuming California is a closed market, M Cubed is ignoring the resale value of used equipment, and is therefore, inaccurately raising the estimate of total costs of the off-road regulation.

Future Replacement Cycles:

If a vehicle was replaced for compliance with the off-road regulation, the M Cubed analysis attributes that cost to the regulation, as well as the costs of shifting the next two replacement vehicles forward. This effectively triples (nominally) the cost per vehicle attributed to the regulation, and inflates the total statewide costs. Fleet owners have the ability to change their replacement schedules at any time; future purchases can be, and would likely be, delayed to

offset an accelerated vehicle purchase for compliance with the off-road regulation. ARB staff did not predict how the regulation will affect future purchases not required by the regulation, and found it unnecessary to attribute costs to the regulation that could occur due to vehicle purchases up to 60 years in the future. However, even assuming accelerated future purchases, the impact would be less than the nominal price of the equipment due to the time-value of money.

Exhaust Retrofit Costs and Feasibility:

The May M Cubed analysis exaggerated the costs of PM retrofits that would be required by applying average retrofit costs for higher hp engines (175 to 400 hp) to the more numerous small engines under 150 hp. M Cubed further exaggerated the cost by arbitrarily assuming that no engines over 150 hp would be retrofit. However, equipment categories with lower horsepower engines (like skid steers) typical have a shorter useful life; thus retrofitting equipment categories with lower horsepower engines would not be as cost-effective as retrofitting equipment categories with higher horsepower and longer useful life. The M Cubed strategy of retrofitting short-lived equipment would have the effect of “touching” a vehicle multiple times as it would be retrofit then, a few years later, turned over. Few fleet owners would retrofit small horsepower engines; thus M Cubed has artificially increased the estimated cost of the rule with faulty assumptions in this area.

Of the available off-road VDECS (including those that are conditionally verified), there are several available for vehicles over 150 hp engines. In addition, Chapter 8 of the Technical Support Document describes several large projects where Level 3 VDECS were installed on vehicles greater than 150 hp. The availability of VDECS is discussed further in the response in section 2)a)i) in Chapter III-A-2 of this FSOR. Because the M Cubed model assumed engines over 150 hp could not be retrofitted with VDECS, turnover was used to fulfill the PM requirements of the regulation. However, the off-road regulation never requires turnover to meet the PM requirements; only VDECS are required. If there are no VDECS available for a vehicle, that vehicle is exempt from the PM requirements until the time when a VDECS becomes available. To assume that a vehicle must be turned over if a VDECS is unavailable is incorrect, and modeling this greatly increases the estimate of overall cost of compliance with the off-road regulation.

In its July analysis, M Cubed increased the estimated cost of a retrofit device from \$63/hp to \$84/hp. The \$63/hp estimate was based on an average VDECS cost of \$18,000 for an average size engine in the 175 to 400 hp group. However, by raising the estimated VDECS costs to \$84/hp for the same hp group, M Cubed is using the \$18,000 cost for a smaller than average vehicle in the 175 to 400 hp range. Using the average VDECS cost for a smaller hp in this range artificially inflates the total VDECS costs calculated. In the July analysis, M

Cubed did not clarify which vehicles could be retrofitted for compliance with the PM requirements of the regulation.

Costs Beyond 2020:

The M Cubed model consolidated costs from the 2008 to 2020 timeframe. Because the off-road regulation is accelerating the turnover of vehicles, these new vehicles will be on the road for many years after 2020. In other words, the ARB annualized the cost of the vehicle purchase over the period of years (i.e., from 2009 to 2030) when vehicles will be used. During this time, VDECS maintenance and reporting costs were also added to the annualized capital costs to arrive at the total annual costs. As long as these vehicles are used, emissions benefits are realized. We believe our approach provides a proper framework to compare the cost and benefit of the regulation over the same time period.

Retirement Rate:

ARB staff does not agree with the M Cubed analysis assumption that in the absence of the regulation, affected vehicles would normally turn over at a rate of 3 percent per year. M Cubed stated that the U.S. EPA recommends the use of a 3 percent retirement rate, but this is incorrect. The U.S. EPA NONROAD model uses a retirement rate of about 7 percent for the off-road vehicles covered by the regulation. Although the 3 percent turnover rate used by M Cubed may be representative of some large earth moving fleets with long-lived vehicles, it is not representative of normal turnover for all fleets in the state. A three percent annual turnover would mean most vehicles last on average 33 years, which, while true for some heavy, long-lived vehicle types, is clearly not the case for shorter-lived vehicles like backhoes and skid steer loaders. Please see the response in section 4)e) of Chapter III-A-4 of this FSOR for further discussion of why ARB staff believe the normal turnover assumptions we used are accurate and the 3 percent used by M Cubed is a severe underestimate of normal turnover.

Additional information on new equipment purchases modeled in ARB's economic model is discussed in Chapter III-A-10 of this FSOR.

New Equipment Costs/Availability:

Staff disagrees that the cost of vehicles will be 60 to 67 percent higher than calculated previously. The new equipment prices used by M Cubed were based on only 3 price lists provided by CIAQC members. ARB staff repeatedly requested these price lists to compare with the equipment prices used in the ARB economic analysis, but they were never provided. A more detailed description of how staff estimated the vehicle costs is discussed in later in this Chapter.

After the introduction of Tier 3 and Tier 4 vehicles into the market, used Tier 3 and Tier 4 vehicles will come into California as used vehicles, potentially from out of state. By 2020, Tier 3 vehicles will have been on the market for 12 to 14 years, and Tier 4 vehicles for 8 to 12 years (depending on horsepower group). Staff believes it reasonable to assume there will be a variety of used Tier 3 and Tier 4 vehicles available. A more thorough discussion of vehicle availability is located in Chapter III-A-2 of this FSOR.

Repower Feasibility:

The M Cubed analysis assumed that 25 percent of the statewide could be feasibly repowered, and incorrectly stated that ARB economic analysis labeled all vehicles as feasible to repower. ARB staff estimated that only 3.5 percent of the statewide fleet would be repowered for compliance with the off-road regulation, and a more detailed description of the repower assumptions in the ARB economic model is given in the responses in Chapter III-A-10 of this FSOR. Repower feasibility is discussed at further length in the response to comment 2)g) in Chapter III-A-2 of this FSOR.

Discount Rate:

Although M Cubed stated staff did not describe the interest rate used in the ARB economic analysis, this information is disclosed in Chapter 11 of the Technical Support Document. Approximately the same real interest rate was used (5 percent) in both M Cubed and ARB staff's economic analysis.

3)d)i) Compliance Costs

- 1. Comment:** Giving the most generous consideration that ARB staff considered a cost benefit of about 7 to 1; (22 billion median saving versus \$3.2 billion median cost = 6.875 to 1). If ARB staff has underestimated the industry cost by a factor of 10 and failed to include up to \$2 billion dollars in consumer cost, this appears to be a very expensive boondoggle for the citizens of California. I want to highlight the gross underestimation of costs in the analysis by the ARB staff. (CEC)
- 2. Comment:** Our cost estimates to comply are nearly five times what your staff estimates is typical. We believe the cost to comply with the regulation will be more than the models predict. Costs are higher for bigger equipment. So we're going to prepare ourselves to pay more. And it's going to cost more to comply with the rule. (BMM3)
- 3. Comment:** NWSC is concerned about the cost analysis in the Staff Report. Comparing the total regulations cost, NWSC total cost is \$15,540,400 compared to ARB's total cost of \$8,100,000. The Staff Report cost analysis is underestimated by 91.86 percent or \$114 per hp for the workover fleet. If the total cost of the regulation is understated by

91.86 percent, the real cost of the regulation could be expected between \$5.75 and \$6.52 billion in 2006 expenditure dollars. We believe that the future cost of the regulation is grossly understated. NWSC's recommendation is for the Board to direct CARB staff to work with stakeholders to capture all the true cost of the regulations. (NWS)

4. **Comment:** We have supplied data to show that the actual cost of compliance is 33 percent to more than a 100 percent higher than the staff estimates. We have tried to show Air Resources Board staff that their cost modeling for emission reductions is unrealistic for repowers as well as retrofits. In our data we show the real costs are in some cases double what the state says they should be. (CAMARILLO4) (CAMARILLO5) (CAMARILLO8)
5. **Comment:** ARB has significantly understated the cost of the regulation. (AGCA3)
6. **Comment:** The staff that prepared these regulations consistently underestimated the actual costs for fleet owners. This was evident on our fleet when the actual costs would be 100 percent more per horsepower than the staff reports estimation. The expected total cost from the Staff Report for our fleet would be \$155 per horsepower. The realistic cost for our fleet is \$233 per horsepower for just the first six years. The Staff Report shows an expected annual cost of \$89,000 a year for a fleet just like ours. Our actual cost would be \$376,666 a year. (THARP)
7. **Comment:** ARB has underestimated the cost of compliance with the regulation. ARB's cost estimate reflects numerous optimistic assumptions that result in a lower cost estimate. ARB cost estimates are based on engine repowers and used vehicle purchase, both of which have limited applicability to many engine types (specifically for the large engines in the MCC large fleet). (MCQUEEN3)
8. **Comment:** CARB staff estimated annual costs of \$403,371 (\$9 per hp per year), \$2,016,855 for the first five years. The actual cost to Downs Equipment will be \$2,484,765 (\$55 per hp per year), \$12,423,825 for the first five years. CARB is underestimating the cost for equipment owners to comply with the regulation. (DER1) (DER3)
9. **Comment:** The cost given by the CARB staff do not reflect real world. Our cost of compliance would be \$9 million for a 6,400 horsepower fleet. That's \$1,400 per horsepower. (MCCOY&SONS)
10. **Comment:** For the type of equipment that our company uses, we found that the average cost per horsepower was on the order of \$1,400, more than ten times the staff's estimate. So if we take \$10 billion for the staff's

estimate, which I think is very generous, for the cost of construction, three billion to homeowners, three billion to employees, we're talking \$16 billion for the total cost to California of this project. It makes our cost benefit ratios against the health savings and the cost per pound look extremely poor. (CEC2)

11. Comment: I believe the genesis of the misunderstanding is rooted in the staff's mandate. The staff was mandated to get this done. They've just got to get it done and forget what the people really want. If you take a look at the compliance numbers for fleets, they are all within the same realm. They are real-world people working real-world jobs. We're not bureaucrats sitting behind a desk pushing a computer model. (CLOUD)

12. Comment: The cost of the regulation is much higher than CARB estimates. The regulation is NOT cost effective. (ECCO2)

13. Comment: The cost for the regulation is optimistic – the fleet cost estimates are ridiculous. (DAVIES)

Agency Response: Staff acknowledges that the total statewide cost of the regulation is expected to be significant. ARB has estimated the total cumulative cost of the regulation between 2009 and 2030 to be between \$3.0 and 3.4 billion (2006 dollars), with the majority of costs these costs occurring between 2010 and 2021. Annually, this represents between \$229 million to \$257 million per year, averaging \$243 million per year (2006 dollars). Staff spent many years soliciting stakeholder input and collecting data for the development of the regulation's economic model. Staff feels that all costs attributable to the regulation are accurately portrayed, and disagrees that the total statewide costs are underestimated.

ARB staff worked throughout the regulation development period to refine the statewide cost estimates, and believes that all costs attributed to the regulation have been included in the statewide estimate. The estimate provided by staff presents an average cost estimate to the statewide fleet; however, depending on the actions of an individual fleet, these costs will vary. As stated in the TSD, there are many different ways to comply with the regulation; these options include replacing a vehicle with a new or used vehicle, repowering with a new engine, installing VDECS, retiring vehicles, or designating vehicles as low use. Staff's cost estimate also includes the costs associated with recordkeeping and reporting. Every fleet has the flexibility to consider numerous paths to compliance with the regulation, with each compliance path varying in total cost.

As stated in Chapter XI of the TSD, the economic impacts of this regulation are based on the anticipated compliance paths of approximately 200 affected fleets. Using this data, the costs to the statewide fleet were calculated by predicting and evaluating the compliance paths for individual real fleets using the ARB Off-road

Compliance Model. Each fleet evaluated varied by horsepower distribution, age, and vehicle type and provided a representation of the variety of fleets present in the state. Because the statewide costs are based on the predicted compliance paths of fleets, the total costs estimated by staff represent the average costs incurred by affected fleets; fleets will potentially experience costs that are higher, and lower, than those costs estimated by staff. Additional details about the ARB economic model can be found in Chapter XI of the TSD.

Many fleets have claimed their estimated \$/hp costs are greater than that estimated by staff. Staff believes the main discrepancy in these cost estimates is the methodology used to calculate the cost of vehicle turnover. When a vehicle is replaced, the fleet incurs an economic cost associated with replacing the vehicle sooner than they normally would (the factor used to reflect the normal replacement age is tied to the vehicle's useful life). Because a fleet, at some point, would have replaced their vehicles due to normal attrition, the entire cost of vehicle turnover cannot be attributed to the regulation. Therefore, when determining the total cost of the regulation, the full cost of vehicle turnover was not used; only the fraction of the cost associated with replacing the vehicle early was attributed to the cost of the regulation. The methodology used to assess the cost of replacing a vehicle in the fleet prior to the end of its normal useful life (which is the turnover cost attributable to the regulation) is shown below and is discussed further in Section C.1.a. of Chapter XI of the Technical Support Document.

$$\text{Accelerated Turnover Costs} = [(\text{Price} - \text{Salvage Price (UL)}) \times (\text{Years Sold Early}/(\text{UL} - \text{Age}))] - \text{Salvage Price (Early)} + \text{Salvage Price (UL)}$$

Where: Price = Price of the vehicle purchased

Salvage Price (UL) = The salvage value of the vehicle at the end of its useful life (UL) in the fleet

Years Sold Early = The difference between the UL of a vehicle and the age of the vehicle when it is sold (should be a positive number or zero)

UL = The useful life of the vehicle (determined by equipment type and normal turnover rate of the fleet)

Salvage Price (Early) = The salvage value of the vehicle when sold before the end of its useful life

Age = The current age of the used vehicle purchased

To attribute the entire turnover cost of a vehicle to the regulation is to assume that a fleet would never replace their vehicles during the normal course of business, and that vehicles have no resale value. Using the entire turnover cost greatly inflates the total cost associated with the regulation.

Red Mountain Machinery, a rental firm in the San Diego area, is one example of a fleet that initially commented that the regulation would be extremely expensive for them but later learned that a good portion of the cost they were estimating

was turnover costs the firm would have encountered even without the regulation. Red Mountain testified at the May Board meeting in San Diego that the regulation would cost them \$23 million over 4 years. Staff worked closely with Red Mountain after the Board hearing to evaluate their fleet and better understand their costs. In working with them, staff learned that their \$23 million estimate included costs for vehicles Red Mountain would normally purchase, even in the absence of the regulation. Red Mountain typically turns over about 6 percent of its horsepower each year; so much of the estimated \$23 million was actually turnover costs that would have occurred even in the absence of the regulation. Also, Red Mountain assumed they would have to control their entire fleet, which operates nationally. Red Mountain operates vehicles in 3 states, and only about 30 percent of their horsepower resides in California on a regular basis. Red Mountain's \$23 million estimate included bringing vehicles outside the state into compliance with the proposed regulation, where in reality Red Mountain could comply by managing their fleet so that only their cleanest vehicles operated in the state. If Red Mountain chooses not to bring their cleanest vehicles to California, they could comply either by maintaining their normal turnover rate and installing retrofits on their vehicles, or by increasing their normal annual turnover rate from 6 percent to about 7.5 percent. Staff estimated that under either of these scenarios, their compliance costs would be no more than \$1.3 million for the purchase and installation of exhaust retrofits, which is significantly less than their earlier \$23 million estimate.

Another area staff looked closely at were how the repower costs were calculated for the regulation. Staff acknowledges that repowers can be expensive, and estimate their cost to be an average of \$270/hp (as presented in the TSD). The repower cost per horsepower used by staff is an average estimate, and therefore, costs for actual repowers experienced by fleets may be either higher or lower than staff's estimates. Although ARB staff originally proposed a lower estimate of average repower costs based on repower cost data collected through the Carl Moyer Program, the estimate was later raised to \$270/hp based on additional data provided by industry representatives. Because the repower costs provided by the affected industries were used, staff feels that the estimated repower costs are accurately reflected in the statewide costs. For a detailed discussion on the validity of repower costs used by ARB staff, see the response to comment 3)d)viii) in this chapter of this FSOR.

In addition, exhaust retrofit costs for the statewide fleet were also considered in ARB's economic analysis. As part of their assessment, staff estimated the costs of exhaust retrofits to be between \$8,000 and \$60,000, depending on the horsepower and Tier level of the vehicle. When a company receives a quote for a single, very expensive retrofit for one machine, it does not mean the average costs in the Staff Report analysis are wrong. As with most of staff's cost estimates, the actual costs are expected to vary by fleet and by vehicle, but be, on balance, near the average used to calculate staff's overall cost estimate. In practice, we expect fleets will be able to reduce their initial retrofit costs by

choosing to do lower-cost retrofits first and delaying higher-cost actions until later. The rule intentionally gives fleets the ability to choose which of their vehicles they retrofit first, which means fleets can choose to retrofit their lower cost vehicles first. It is expected that in the near future, there should be more retrofit options and competition in the future, which is likely to put downward pressures on current off-road retrofit prices. As retrofits become more prevalent (as more products are available during the first few years of the regulation), future retrofit costs could be even less than those estimated by the ARB staff. However, to be conservative, ARB staff did not consider likely decreases in installed retrofit costs over time (likely due to increased production volumes and improved economies of scale from retrofit manufacturers). Additionally, costs for retrofit maintenance and fuel penalty costs associated with the retrofit devices were also included in the total statewide costs. For a more detailed discussion on the validity of retrofit costs used by ARB staff, see the response to comment 3)d)ix) in this chapter of this FSOR.

Finally, staff understands that there are costs associated with the reporting and recordkeeping aspects of the regulation. As such, staff also included those costs in the total statewide costs as well. These costs are discussed more thoroughly in Chapter XI of the TSD.

For a more detailed discussion of cost-effectiveness, see the response to comment 3)d)v) in this chapter of this FSOR. For a more detailed discussion of affordability, see section 3)a) in this chapter of this FSOR.

3)d)i)1) Inaccurate Mining Costs

- 1. Comment:** Concerns have arisen that the regulation will not accurately reflect the type of fleet used in mining operations. As a result, the costs of complying with the rule are far greater for such companies than assumed by ARB. Companies, like Blue Mountain Minerals, with special sized fleets specific to their industry, are in fact being penalized by the ARB's general assumptions of the costs to comply with the regulation. (BERRYHILL)
- 2. Comment:** The conclusion from the cost calculations is that ARB's cost estimate of \$140 per horsepower (on average) underestimates the compliance cost for a mining fleet by a factor of ten. Due to the size and complexity of the engines in the mining fleet, the cost of new vehicle replacement is between \$1,300 and \$2,200 per horsepower, based on actual vendor quotations. (MCQUEEN3)

Agency Response: We believe the cost estimates in Chapter XI of the TSD, which are meant to reflect costs for average fleets, are approximately a third lower than what Blue Mountain Minerals (BMM) would actually face. However, we do not believe this means the overall cost estimates in the TSD are flawed. Quite the opposite, this clearly illustrates that, as discussed in the TSD, there are a range of costs that different fleets may face in complying with the

regulation, and points out that some unique fleets will have higher than average costs (it can also be said that there will be fleets that have lower than average costs as well).

To better understand the economic impacts facing BMM, we met with BMM on July 5, 2007, to discuss the discrepancies between the costs analysis performed by BMM and the cost estimates provided by ARB staff. We found that BMM had overstated their costs by overestimating the cost of haul trucks, by not subtracting from their costs the projected dollars gained from selling used vehicles, and by not converting their costs to 2006 dollars. We also found that ARB's average analysis would tend to underestimate BMM's cost because mining haul trucks tend to cost more than assumed by ARB.

Based on this analysis, we understand that the average costs reported in the TSD for the statewide fleet may not properly reflect some types of mining equipment, such as a haul trucks. However, staff does not believe that the costs for the mining industry are underestimated by a factor of ten (as suggested by commenter MCQUEEN3). The main discrepancy that usually arises when calculating the cost of regulatory compliance is in the methodology used to calculate the cost of vehicle turnover. When a vehicle is replaced, the fleet incurs an economic cost associated with replacing the vehicle sooner than they normally would. However, in calculating this cost, only the portion of the vehicle turnover cost associated with early turnover should be attributed to the regulation (not the full cost of replacing the vehicle). The ten times higher costs cited by commenter MCQUEEN3 would inappropriately attribute the full cost of buying a new vehicle, not just the cost of buying it earlier than normal, to the regulation, resulting in a significant overestimation of costs. A more detailed discussion of this turnover cost issue is discussed in section 3)d)i) in this chapter of this FSOR.

3)d)i)2 Inaccurate Waste Removal Costs

1. Comment: There is a disparity between the cost analysis performed by the ARB model and Waste Management. While the ARB's cost model may be more accurate for off-road diesel fleets in general, it does not appear to take into account the specific business realities and constraints faced by waste collection service off-road fleets. For instance: Although the ARB cost model returns a cost of \$80 per brake-horse power (bhp) for fleets with an average equipment age of 12 years, our own estimates (using the most cost effective scenarios possible) show a projected cost of \$300 to \$500 per bhp. (STODDARD)

Agency Response: We acknowledge that the costs for the waste removal industry were not called out separately in the off-road economic analysis described in the Staff Report and Technical Support Document. However, as stated in the response above in section 3)d)i) in this chapter of this FSOR, the economic analysis represents the average costs for those fleets affected by the

off-road regulation. Therefore, costs experienced by the waste removal industry could potentially be higher, or lower, than the costs presented by staff.

Although we have not received fleet data from Waste Management that would enable us to estimate their compliance costs, we suspect that the discrepancy between the costs predicted by the ARB cost model and Waste Management's own estimate may arise from Waste Management inappropriately assigning cost for normal vehicle turnover to the regulation. In discussing the economic impacts of the regulation with individual fleets, we have found that that is the most common cause for discrepancy between ARB staff estimates and industry estimates of cost of regulatory compliance. When a vehicle is replaced, the fleet incurs an economic cost associated with replacing the vehicle sooner than they normally would. However, as discussed in Section C of Chapter XI of the TSD, only the portion of the vehicle turnover cost associated with early turnover should be attributed to the regulation, not the full cost of the vehicle turnover. A more detailed discussion of this turnover cost discrepancy is discussed in the response above in section 3)d)i) in this chapter of this FSOR.

3)d)ii) Cost Discrepancy

- 1. Comment:** We estimate the total industry-wide cost of implementing this regulation to be upward of \$13 billion. (MALDONADO2)
- 2. Comment:** The regulation will cost the California construction industry an additional \$13 billion to comply (CIAQC2)
- 3. Comment:** A conservative estimate of regulations cost is \$13 billion. (EDWARD) (GAINES)
- 4. Comment:** ARB Staff has acknowledged the cost of this regulation to be \$3 billion. However, industry sources believe it could be at least three times this amount. (USN)
- 5. Comment:** We estimate the total industry-wide cost of implementing these proposed rules to be upward of \$13 billion. (ARTBA1) (LAMON) (MILLER)
- 6. Comment:** We estimate the total industry-wide cost of implementing these proposed rules to be upward of \$9 billion. (MCCULLOUGH) (MCQUEEN1) (SR) (VC&M)
- 7. Comment:** It is estimated that the new regulations will cost industry over \$9 billion to purchase new equipment or retrofit their current fleets. (ANDERSON1)
- 8. Comment:** We disagree with the cost assessment conducted by ARB staff and believe the M Cubed cost assessment prepared on behalf of the

Construction Industry Air Quality Coalition is a more accurate assessment. (CALCIMA)

9. **Comment:** The regulation is estimated to be a cumulative cost of \$3.0 to \$3.4 billion between 2009 and 2030. The construction industry estimates this cost to be \$9 to \$11 billion. We realize the staff has spent a lot of time and money developing this report, but with the regulations this important the economic impacts written should be accurate. It's wrong to present this report to the CARB for approval with a statewide cost estimate that's at least \$6 billion off. It's unscrupulous to underestimate the economic impact of a regulation on an industry by 200% and still present this for approval by the board. (THARP)
10. **Comment:** There is a huge discrepancy in estimated costs of compliance between the ARB staff and industry. The truth of the actual costs must be made known. (CALPASC1)
11. **Comment:** The economic forecasts, both that provided by CARB and that provided by CIAQC, have not changed numerically since their original announcements. We also feel that special attention needs to be paid to the \$10+ billion difference between the two forecasts. With such an immense difference, it is clear that the two parties are using drastically-different economic models and making very different assumptions. We feel it is imperative that these differences be reconciled and understood, as the construction industry does not function in the same manner as other forms of business. (HCC)
12. **Comment:** One of the things that trouble us is the significant difference in the cost estimates from ARB staff and from the construction industry. We're talking the difference between \$3 billion and \$13 billion. That's a pretty scary disparity. I don't necessarily think that it's safe to make a decision like this without knowing is it \$3 billion or \$13 billion? If it was the \$13 billion mark, then I think this Board would probably go about the decision they're making a little bit differently. (SACBES)
13. **Comment:** You have three million versus 12 million, coming from two honest entities. You've got an individual affected business this is saying it's \$2 million versus less than \$300,000, you've got a serious problem. And I think that that's something that needs to be looked at before you proceed with this. Because if you're going to do this and it's going to affect that many people, you need to make sure you've got the right information that's being interpreted correctly before you move forward. (BCL2)
14. **Comment:** The regulation in its current form is simply not viable for several key reasons, including the vast differences in projected costs

between CARB's \$3 billion estimate and the industry's claim of a \$13 billion impact. (DUVALL)

15. Comment: The estimated costs of meeting these new regulations vary greatly. The CARB staff report estimates the cost impact to the construction industry at nearly \$3 billion, which CARB admits would be the most expensive regulation ever issued. More concerning, however, is the industry analysis which estimates the impact would be more than quadruple that amount at \$13 billion, from 2009-2020. (MARGETT)

16. Comment: The 'coalition' presents costs as 13 billion while the 'board' 3 billion. (RONSIN2)

17. Comment: We are very concerned about the cost of staff's proposed regulations. Based on the numbers I've heard today from the example that staff gave earlier of a fleet with 112 pieces of equipment, staff's estimate was \$300,000 on average per year. There's 180,000 pieces of equipment out there. If you project that out, that's \$.6 billion per year. And that fleet was ostensibly a pretty standard fleet. Pretty representative of the overall condition of our fleet today. \$.6 billion per year times 20 years amounts to \$12 billion. So based on staff's specific analysis of a fleet, we have an impact of \$12 billion. This is pretty close to the impact that we're estimating. And that's just the direct impact. So hopefully we can get a little clarification on that. (BIA-SD2)

18. Comment: While CARB estimated that the state's total cost to meet the proposed regulations will be about \$3.4 billion, the Construction Industry Air Quality Coalition contends that the cost of compliance for California will be closer to \$13.5 billion, with an average cost to companies of \$623 per horsepower unit. (CAR)

19. Comment: Despite my full support for the goals of the proposed CARB regulation, in its current form it is simply not viable for several key reasons. The difference in CARB's projected cost estimate of \$3 billion and that of the construction industry's projected \$13 billion raises great concern. Such discrepancies in cost estimates must indicate further evaluation of the regulations' ultimate fiscal effect on the construction industry. (HUFF)

20. Comment: I'm not sure that the numbers that we're looking at from the economic standpoint are close on either side. But obviously there's a disconnect in the dollars. (AGCA5)

Agency Response: ARB staff spent many years soliciting stakeholder input and collecting data for the development of the off-road regulation economic model. Staff feels that all costs attributable to the regulation are accurately portrayed,

and disagree that the total statewide costs were underestimated. Therefore, staff also disagrees that the statewide costs will be \$6 billion to \$13 billion. One stakeholder group, the Construction Industry Air Quality Coalition hired a consultant, M Cubed, to critique staff's estimate of the cost of the regulation and to prepare their own estimate. M Cubed prepared several versions of their analysis, including one presented in May 2007 and one presented in July 2007. Staff held a workgroup meeting to present and discuss staff's methodology for estimating cost of the regulation on June 18, 2007, to go over each of the differences between staff's analysis and M Cubed's analysis. At this workgroup meeting, ARB staff showed how many assumptions used by M Cubed for the industry economic analysis were inappropriate and artificially inflated the total statewide costs. M Cubed claimed that the ARB economic model was too sensitive to the costs and variables used to estimate the statewide costs; however, as discussed in Chapter 10 of this FSOR, the ARB economic model is not very sensitive to various perturbations of the parameters where ARB and industry disagree. Therefore, staff stands behind their economic analysis, and believes that the model presented by M Cubed presents a gross overestimate of the total statewide costs. For a more detailed discussion of the differences between the ARB and M Cubed economic analysis, see the responses in section 3)c) in this chapter of this FSOR.

For a more detailed discussion of the compliance costs of the regulation, see the responses in section 3)d)i) in this chapter of this FSOR.

3)d)iii) Third Party Cost Evaluation

- 1. Comment:** We should be looking for the best economic information. Get something analogous to a best science review to review the economics. (BCL2)
- 2. Comment:** CARB should take the time to do an independent analysis by an agency or firm familiar with the industry, of the economics and assumptions used by staff to determining the industry's ability to afford this regulation. (CIAQC7)
- 3. Comment:** If possible, it would be advisable to retain the services of an experienced, neutral third party who understands the industries involved but is not politically or financially motivated to favor anyone, so that you may have confidence in the results. (HCC)
- 4. Comment:** What needs to really be done is to have a third party perspective. Someone to look at the numbers from the construction industry, someone to look at the numbers from ARB, and to come up with look at the methodology of the different studies and find out if the cost of the regulation is going to be three billion or \$13 billion. (SACBES)

Agency Response: We did not solicit a third party review of staff's economic analysis because we believed our methodology was sound and our results reasonable and accurate. (See responses in section 3)c) of this chapter of this FSOR for further discussion of this.) However, one stakeholder group did solicit such a review. The review was conducted by Dr. Neil Eldin, Ph.D., Professional Engineer and entitled "An Examination of the Construction Industry Compliance Costs for CARB's Off-Road Diesel Vehicle Rule." The review was submitted into the rulemaking docket for the in-use off-road diesel vehicle regulation and is available on ARB's website as comment 21 presented during the Board hearing at www.arb.ca.gov/lispub/comm/bccommlog.php?listname=ordiesl07.

Dr. Eldin is a professor and head of the department of construction technology at the Purdue School of Engineering and Technology. He is a civil engineer with over 30 years of professional experience in the area of construction engineering and management. He recently was project manager for design, procurement, and construction of two power plants, a project with a budget of over \$350 million.

Dr. Eldin independently estimated that the cost of the regulation would be about \$3 billion, which is in line with ARB staff estimates.

3)d)iv) Inaccurate Understanding of Affected Industries

- 1. Comment:** CARB does not have a good handle on how much this regulation will cost as there are too many variables associated with such a complicated regulation. (TA)
- 2. Comment:** What is not understood is that construction is a very active and time scheduled business, much more unpredictable than manufacturing or most businesses. It has to accommodate all the 'unplannable' variables like weather changes, and have people and equipment available when needed, to continue work efficiently on the 'front'. Anything that interferes or complicates this already tough issue has a tremendously magnifying effect on costs. The unavailability of a piece of equipment because rules prevent its use or delay availability once the need is identified, can halt all progress on a site. (RONSIN1) (RONSIN2)
- 3. Comment:** The rules would suggest a continual, year by year, improvement in a contractor's fleet. This is a fairly linear flow of money but the contracting industry is anything but linear. Most contractors have had a good ride the last few years but we all can remember slow downs in our industry segments. Ask anyone associated with the home building industry. (LAMON)
- 4. Comment:** But what you can't help but hear about on the news is how much money the contractor (maze project in Oakland) is making. And I'm wondering if possibly that profit margin is what the CARB staff has based

their financial statistics on, because clearly my experience in almost a decade in this industry is that profit margins for most contracting companies are between 3 and 5 percent. What's going on at the maze is not typical of what happens here. And I've actually seen some multi-million dollar bids being lost from some of our contractor companies by just a few hundred bucks. So it's a fiercely competitive market that we're dealing with out here. (EUCA6)

5. **Comment:** I do believe in my heart of hearts there is a disconnection between what takes our business to run and what staff believes takes our business to run. (ERRECA)
6. **Comment:** It is too bad that these regulations will probably be implemented by CARB without any real understanding of the affect that they will have on the individual's that own and work for private business in this state. . I expect that the phrase that I heard more than once in the workshops here from CARB staff "...we didn't think of that.." will be used again and again in the years to come as the unintended consequences of these regulations devastate a large portion of the construction industry in the state, put out of business many heavy construction equipment owners both large and small and cause a huge escalation in the cost of public works construction and the price of a home in California. Your staff has not shown they have the understanding, ability or desire to an honest economic analysis even though the industry has made a huge effort to "educate" them on our industry. The economic models presented by CARB staff in the workshops and in the staff report show there is huge lack of understanding on the part of the staff of how the economics of contracting and equipment ownership work. (SHAWM1)
7. **Comment:** We know that your staff does not have a good handle on what it takes to do our business. They don't understand the financing. They don't understand the bonding. They don't understand how the equity works in this. (P&S)
8. **Comment:** I feel that CARB does not look closely enough at the real consequences to our businesses and in turn to the state of California and people employed in California. (MSSE)
9. **Comment:** We don't support your staff's Pollyanna-ish view of the construction economics and construction practices. We wish they understood this business more. We spent a lot of time trying to educate them about that. (CBCC3)
10. **Comment:** The economic impact to individual companies must encompass the impact of financing, in-process contracts, bonding and profitability. (VCE1)

Agency Response: Although we recognize that ARB staff does not have the same intimate familiarity with the construction business as those who work in that business every day, we believe that through the research, outreach, and public process conducted over the three years leading up to the regulation's adoption, we gained enough information to generate an accurate estimate of the impacts of the regulation.

Throughout the development of the regulation, ARB staff held over a dozen public workshops and work groups dating back to November 2004. A complete list of meetings held between November 2004 and April 2007 is shown in Chapter III of the off-road Staff Report. During these meetings, ARB staff solicited input from the affected industries on the proposed regulatory language, as well as comments pertaining to the economic analysis performed by ARB staff. After M Cubed (on behalf of Construction Industry Air Quality Coalition, or CIAQC) released their \$13 billion statewide cost estimate, many meetings were held between ARB staff and industry representatives to discuss the discrepancies between the \$3 billion ARB staff estimated costs, and the \$13 billion estimated costs estimated by industry. In addition, a public workshop was also held on June 18, 2007 to describe the differences between the ARB economic model, and the one developed by M Cubed. After analyzing the model used by M Cubed, ARB staff found many assumptions in the industry model that were inappropriate (such as the estimated natural turnover rate of the statewide fleet and the compliance choices most fleets will make), and determined that the statewide costs presented by industry were inflated due to those invalid assumptions. A detailed discussion of the differences between the ARB and M Cubed economic models is located in the responses in section 3)c) of this chapter of this FSOR.

In addition to the M Cubed analysis, many fleets were concerned that we did not reflect costs for the regulation accurately; many computed compliance costs much higher than those presented in the off-road Staff Report. As discussed in sections 3)d)i) and 3)d)vii) of this chapter of this FSOR (which discuss compliance cost and vehicle cost discrepancies, respectively), the biggest discrepancy between ARB staff estimated costs and the costs estimated by fleets is the method used to compute turnover costs attributable to the regulation. When the regulation drives a fleet to purchase a new vehicle earlier than they otherwise would have, the full cost of the new vehicles cannot be attributed to the regulation. Only the cost of accelerating the purchase can be attributed to the regulation. This effect is discussed further in Section C.1.a. Accelerated Turnover of Chapter XI of the Technical Support Document.

After calculating the statewide costs of the regulation, ARB staff also looked at how the costs would impact a fleet's profitability. As stated in Chapter XI of the TSD, most affected businesses would be able to absorb the costs of the proposed regulation with no significant adverse impacts on their profitability. For

a more detailed discussion on affordability and passing on costs, see the responses in sections 3)a)i) and 3)e)vi) in this chapter of this FSOR, respectively. For additional discussion on the ROE analysis, see the response in section 3)h) in this chapter of this FSOR.

After performing the return on equity analysis for the affected industries and several sample fleets, ARB staff also looked at other financial impacts on multiple fleets. Staff met with many individual fleets, and after calculating expected compliance costs, met with each fleet to talk about how the regulatory costs would affect their profits, finances, contracts, and bonding capabilities. Then, at a workshop held on July 16, 2007, staff discussed their findings on how the costs of the regulation would affect nine fleets; these fleets varied in age, size, and equipment type. An incremental cash flow analysis was prepared for several of the sample fleets, and showed how compliance costs could be spread out based using different loan periods and rates. Additionally, staff also looked at the fleet's cumulative debt that would occur due to the regulation. Staff acknowledges that many of the affected industries, such as the construction industry, are cyclical, and expect that many fleets will have to pass on some of the compliance costs or spread out costs through financing options. For a more detailed discussion on fleet financial impacts, see the responses in section 3)e) in this chapter of this FSOR.

ARB staff worked with industry throughout the development of the regulation, and feels that with their input, staff developed an economic model that accurately reflects the costs for compliance with the statewide fleet. Additionally, ARB staff worked very closely with an economist in ARB's Research and Economic Studies Branch, to ensure that all financial information from the affected industries was evaluated correctly, and that the statewide economic analysis was performed in a consistent manner with the economic evaluations of past ARB regulations.

3)d)v) Cost-effectiveness

- 1. Comment:** It is imperative that we put together a regulation that is cost-effective for the equipment owners in the State. (ECCO5)
- 2. Comment:** AGC believes that ARB significantly understates the cost of the rule, and in turn, its cost effectiveness (as a cost-per-ton of reducing the pollutants that the rule covers). AGC challenges the feasibility, cost effectiveness, alternatives analysis, and impacts of ARB's proposed regulation. (PILCONIS) (AGCA3)
- 3. Comment:** The regulation is not cost-effective. (ECCO2)
- 4. Comment:** ARB's proposal is wildly cost ineffective as a control strategy for particulate matter. For example, the South Coast Air Quality Management District (SCAQMD) incentive program has set incremental cost effectiveness at \$6.70/pound (\$13,400/ton) for particulate matter. By

contrast, ARB estimates that the off-road, in-use diesel proposal will reduce particulate matter at between \$37 and \$43 per pound (\$74,000 to \$83,000 per ton) for particulate matter. (PILCONIS) (AGCA3)

5. **Comment:** ARB justifies the cost-effectiveness of the regulation by comparing it to a rulemaking on public fleets that ARB adopted, which ARB estimated to cost \$159.95 per pound (\$319,900/ton) of particulate. Given the governmental relationships binding ARB and the regulated public fleets, ARB should not attempt to bridge the cost-effectiveness data from its public-fleet rule to private fleets. Instead, ARB should recognize that – in addition to the unprecedented unfairness of changing the standards applicable to in-use vehicles – this rule is the most expensive rule that ARB ever has imposed on private industry. The public entities' failure to challenge ARB's unlawful action does not preclude private entities from challenging such actions here. (PILCONIS) (AGCA3)
6. **Comment:** ARB should consider limiting the rule's applicability to public fleets. Limiting the rule to public fleets would follow past precedents for public fleets' serving as incubators for new technologies and would address industry's concern that retrofit-package and new-vehicle manufacturers cannot meet demand if ARB's proposal applies to both public and private fleets. (PILCONIS) (AGCA3)

Agency Response: ARB staff agrees on the importance of the off-road regulation being cost-effective. As discussed in Chapter 7 of the Staff Report and Chapter 11 of the TSD, staff concluded that the off-road regulation is cost-effective at an estimated \$2.1 per pound (/lb) to \$2.5/lb for NOx and \$37/lb to \$43/lb for PM. In addition, the cost-effectiveness of the regulation is within the range of measures previously adopted by ARB, and is more cost-effective than the Public Fleets Rule. As stated in Chapter 11 of the TSD, the regulation's estimated PM cost effectiveness of \$40/lb of PM is about 6 times lower than the U.S. EPA's benchmark for value of avoided death (which equates to about \$248/lb). Therefore, this regulation is considered a cost-effective mechanism to reduce premature deaths that would otherwise be caused by diesel PM emissions without this regulation.

Although the cost-effectiveness of the regulation is higher than the cost-effectiveness limits used by the South Coast Air Quality Management District (SCAQMD), it was unclear if the commenter was referring to the limits used for SCAQMD funding programs, or the SCAQMD minor source best available control technology (MSBACT) requirements for stationary sources; because of this uncertainty, we will addresses both cases in this response. First, the limits on cost-effectiveness for funding programs are much different then those used in a regulatory setting. Many air districts set low cost-effectiveness limits for distributing grant monies. This is to ensure the grant monies maximize emission reductions to the greatest extent possible within a given region. These grant

programs, such as the Carl Moyer program, are designed to affect only a fraction of the statewide fleet. Therefore, it is not appropriate to assume that a regulation affecting the statewide off-road fleet should be held to the same cost-effectiveness standards as a grant program. Second, the MSBACT incremental cost effectiveness limits used by the SCAQMD only apply to PM10 for minor stationary sources. For major stationary sources, BACT is required on all sources regardless of cost, unless the cost is sufficiently great to cause the project not to be constructed or operated. Because stationary sources use different control technologies for their BACT requirements, it is also not appropriate to compare the cost-effectiveness criteria for the MSBACT program to the cost-effectiveness levels estimated for the off-road regulation, which is a mobile source regulation.

Staff does not believe that adopting in-use performance requirements for off-road vehicles is inherently unfair. For discussion regarding ARB's authority to adopt in-use standards see, Chapter III-A-19 of this FSOR. For discussion of why the regulation is necessary, see the Staff Report, Chapter II.

For a discussion of technical feasibility, see Chapter III-A-2 of this FSOR.

For a discussion of staff's estimates of the cost of the regulation, see section 3)c) in this chapter of this FSOR.

For a discussion of rule applicability, see section 6)a) of Chapter III-A-6 of this FSOR. For a discussion of why it is necessary for the regulation to apply to in-use owners of off-road vehicles rather than just vehicle and engine manufacturers, see section 6)a)i) of Chapter III-A-6 of this FSOR. For a discussion of the Carl Moyer program and the use of incentive funding for compliance with this regulation, see section 6)e) of Chapter III-A-6 of this FSOR.

For a discussion of the analysis of alternatives, see Chapter III-A-8 of this FSOR.

3)d)vi) Cost Range

- 1. Comment:** At a minimum, ARB needs to show the true cost of the rule as a range of costs, including both the low end and the high end of the potential cost, where the high end is based on conservative assumptions. This is standard practice when estimating costs for a project where there are many uncertainties about circumstances in the future and many assumptions that have to be made. (MCQUEEN3)
- 2. Comment:** The ARB staff analysis is highly sensitive to changes in assumptions about things -- about items and various parameters that really aren't documented or empirically based. Staff and consultants should be presenting a range of numbers that represent the uncertainty about the analyses: The uncertainty about the cost; the uncertainty about

the population of vehicles; the characteristics of the vehicles; and the type of technologies that will be available should all be incorporated. (M3CON)

Agency Response: ARB staff presented the total statewide cost of the regulation as a range of \$3.0 to \$3.4 billion. As shown in Chapter 11 of the TSD, there are many different ways to comply with the regulation, ranging from turnover to new vehicles to retiring vehicles from a fleet. Because there are many compliance options, the cost for each fleet will vary depending on the compliance path chosen. The sum of these variances is represented as the \$3.0 to \$3.4 billion range of statewide costs.

In developing its cost estimate, staff did not incorporate vehicle cost increases due to adverse economic or market conditions, as such costs are not predictable. However, staff did incorporate more predictable, quantifiable increases in cost, such as incremental cost increases for Tier 4 vehicles, as well as a transportation cost associated with the shipping of Tier 0 vehicles for sale outside the state. These costs were used to account for the expected increase in Tier 4 vehicle costs (due to the addition of required aftertreatment and other emission reduction technologies) and the necessity for many fleets to sell and ship their Tier 0 vehicles out of state. These costs are discussed in more detail in the response for 3)d)vii) in this chapter of this FSOR.

While staff did not account for uncertainty in the off-road vehicle population when calculating the total costs of the regulation, staff feels that the off-road inventory is the most accurate inventory available, and can be effectively used to estimate statewide costs for California. A more detailed discussion on the validity of the off-road inventory can be found in Chapter 6 of the TSD, and Chapter III-A-4 of this FSOR.

Also staff believes that the \$3.0 to \$3.4 billion cost estimate includes the most realistic assumptions of available technology for compliance with the off-road regulation. In general, staff utilized conservative estimates of the suitability of low cost compliance options, and in many cases, assumed fleets would need to take the least cost-effective action for compliance. For example, because it is uncertain that Tier 4 repowers will be available, staff did not assume or incorporate their use as a compliance option, even though they could be a cost-effective replacement option if developed. Additionally, many retrofit devices that achieve reductions in both NOx and PM are currently in the demonstration or verification process. However, as this technology is not yet widely available today, staff conservatively estimated that no more than five percent of vehicles would be able to use this technology. This is a conservative cost assumption because it assumes most fleets will use less cost-effective NOx compliance options (such as vehicle turnover or repowering) instead of using a NOx VDECS. Repowering is also a more cost-effective option for compliance with the regulation. However, staff acknowledges that repowers are not feasible for all vehicles, and therefore, repowers were only assumed to occur on approximately

four percent of the statewide fleet. This also is a conservative cost estimate because the replacement of vehicles can be much more costly than repowers for higher horsepower vehicles, such as scrapers. A more detailed discussion of the ARB economic model is located in Chapter 11 of the TSD, and Chapter III-A-10 of this FSOR.

The ARB economic model developed by staff is not particularly sensitive to various perturbations of the parameters used to calculate the statewide costs. Therefore, staff believes the assumptions used (such as vehicle costs and available technologies) produce a range of costs that are realistic and indicative of the real costs that will be experienced statewide with the regulation. A more detailed discussion of the ARB economic model sensitivities is located in the first response in Chapter III-A-10 of this FSOR.

3)d)vii) Underestimated Vehicle Costs

- 1. Comment:** New equipment costs are underestimated. The Tier 3 and Tier 4 engines cost substantially more than Tier 1 and Tier 2 engines. This has increased the cost of new machines. (CIAQC7) (AGCA3)
- 2. Comment:** The ARB Staff relies on a survey of used equipment to estimate new vehicle prices using resale prices from two auction house websites. However, a comparison of the ARB's new machine prices was made with three new equipment price lists for several hundred vehicles compiled by CIAQC members. Based on a comparison between these quotes and the Staff analysis, the staff's new equipment prices are 35 to 45 percent lower than quotes provided to industry firms. (CIAQC1) (CIAQC6) (CIAQC10) (AGCA3)
- 3. Comment:** ARB has underestimated the cost of the new equipment that the rule would require fleet owners to purchase. ARB's estimates for new equipment are significantly lower than actual quotes provided to AGC-member companies by their equipment dealers. (AGCA3)
- 4. Comment:** Construction equipment prices have been escalating at eight to ten percent per year for the last decade. When the Tier 4 machines become generally available in 2015, they are likely to 70 to 80 percent more expensive than the machines they replace. (AGCA3)
- 5. Comment:** The estimates of resale value of Tier 0 equipment given by CARB are too high and the estimates for Tier 2 and Tier 3 are too low. CARB staff claims that because California is just one state, the old machines that drag down a fleet's average can be sold to operators in other states with no reduction in value! Our company estimates a loss of value of Tier 0 equipment of 20-40 percent immediately, with Tier 1 values falling similarly (beyond normal depreciation) within 5 years. Applying the

same laws of economics over the same period of time, the price of desirable Tier 2 and Tier 3 equipment will be affected in the opposite way, rising 20-40 percent. (ECCO2)

6. **Comment:** We feel that it's clearly going to be higher than \$10 per horsepower cost to a contractor to sell his equipment. We think conservatively, it's probably going to be \$20 to \$40 per horsepower, maybe on average \$40 to \$70, and maybe realistically, it could be as high as \$70 to \$100 per horsepower. Even if you average \$50 a horsepower as the cost to sell used equipment, when it comes to capital in updating the fleet and repowering, it's going to have a huge impact on the contractors. I was asked to review that section and ask -- and answer whether I felt that the \$10 per hour horsepower was realistic or not. I don't feel it is. \$50 a horsepower is conservative. I think it could be considerably higher, because the majority of this equipment is going to be heavy iron; it's going to scrapers and large dozers that are going to take the biggest hit. And I think it's going to have the biggest impact to contractors. So I think it's probably going to be closer to the \$70 to \$100 range than \$50. But even if you use \$50, it's 500 percent higher than what you're estimating. (RB2)

Agency Response: We believe that the vehicle costs modeled in the ARB economic analysis are accurate, comprehensive average statewide vehicle costs. At the end of 2006, ARB staff compiled new and used vehicle sale prices from nationwide equipment sales web sites for over 2,000 vehicles in a range of horsepower categories from multiple manufacturers. Best fit curves were then developed for these new and used vehicles, for each vehicle type, to provide a means to estimate the value of equipment with time (i.e., to determine how the value of the equipment declines as it ages). These price curves were then used to represent the average vehicle replacement cost without the regulation as a baseline. Sample curves for skid steer loaders and scrapers are presented in Chapter 11 of the TSD. While we recognize that some vehicles will have prices higher or lower than the average, the average cost curves were used to best represent prices for vehicles used in construction and other industries. A complete table of the average \$/hp values by vehicle age can be found in Appendix J of the TSD.

Additionally, staff disagrees with the need to increase the cost estimates for new vehicles. The new equipment prices used by M.Cubed in the CICM economic analysis were based on only 3 price lists provided by CIAQC members. Although we repeatedly requested these price lists, these price lists were never given to ARB staff to compare with the equipment prices used in the ARB economic analysis. Since ARB staff was not given the opportunity to review the CIAQC lists, staff was unable to verify if their vehicle prices properly represent an average vehicle price or simply reflect higher than average equipment costs. As a result, and without any additional data to suggest otherwise, staff opted to

continue to use the vehicle costs per horsepower used in the ARB economic analysis.

As stated in Chapter 11 of the TSD, Tier 4 engines are expected to cost more because of the exhaust aftertreatment technology expected to be used in those engines. However, staff does not believe that Tier 4 vehicles will increase 70 to 80 percent in cost. The 2007 model year on-road truck engine price increased about \$7000 compared to the 2006 model year. Similar price increases are anticipated with Tier 4 off-road engines. In evaluating the potential cost increase for vehicles equipped with Tier 4 engines, staff estimated the incremental cost increase to be about the price of an aftermarket exhaust retrofit device. This cost premium was reflected in the analysis where a fleet purchases a Tier 4 vehicle early or is required to add more Tier 4 vehicles than it normally would.

Because California only represents an estimated 11 percent of the national market, it is not expected that the value of older equipment will drop dramatically. As staff acknowledged in Chapter 11 of the TSD, there will be greater demand for clean (higher tiered) vehicles throughout the state, and a correspondingly lower demand for dirty (lower tiered or unregulated) vehicles in the state. Since staff estimates that off-road vehicles are already purchased and sold in a nationwide (and worldwide) market, staff expects fleet owners to buy more higher tiered vehicles from out of state (or out of country) and bring them into California, and sell more lower tiered vehicles outside California in order to fulfill their compliance requirements. However, to estimate the potential price impact on changes in demand for clean and dirty vehicles, staff estimated a price premium based on the transportation cost to ship transacted vehicles into and out of the state. The transportation cost was estimated at being equivalent to \$10/hp, and this cost was added to the price of every vehicle (new or used) purchased for compliance with the regulation. Staff believes the addition of \$10/hp is adequate to address the costs of transporting older vehicles out-of-state, as the future demands in the worldwide equipment market cannot be predicted. To increase the transportation cost to more than \$10/hp based on future estimated market demands (or lack thereof) would overly inflate the cost of compliance with the regulation without basis, and would be speculative at best.

3)d)vii)1) Vehicle Replacement

- 1. Comment:** The majority of the vehicles with high operating hours at cement plants are over 600 horsepower. For vehicles over 600 horsepower, the vehicle replacement cost is between \$750,000 and \$1.5 million per vehicle, which corresponds to a rule compliance cost of between \$1,000 and \$2,000 per horsepower. (MCQUEEN1) (MCQUEEN2)
- 2. Comment:** Equipment that is available is very expensive. (AWD)

Agency Response: ARB staff acknowledges that the purchasing of new vehicles can be expensive. As provided in Appendix J of the TSD, average new equipment prices can range from \$462 to \$1,501/hp depending on vehicle type. However, the regulation does not require turnover to new vehicles. Under the specialty vehicle provisions, if a repower solution or used vehicle cannot be purchased to replace an older vehicle, a new purchase is not required for compliance. In addition, NOx exhaust retrofits may be a cost-effective compliance option for many fleets that are required to meet the NOx requirements of the regulation. Currently, there are several manufacturers with NOx plus PM devices for off-road vehicles that are participating in the Off-Road Showcase Program (which is discussed further in the responses in section 2)a) in Chapter III-A-2 of this FSOR). If ultimately verified, such devices could provide an alternative to repowering with new engines or replacing vehicles.

Finally, it is important to note that even when the regulation drives a fleet to purchase a new vehicle earlier than they otherwise would, the full cost of the new vehicles cannot be attributed to the regulation. Only the cost of accelerating the purchase can be attributed to the regulation. For example, if a \$1.5 million vehicle is purchased one year earlier than in the absence of the regulation and such a vehicle would be expected to last 20 years, only five percent of the \$1.5 million can be attributed to the regulation. This effect is discussed further in Section C.1.a. of Chapter XI of the Technical Support Document.

3)d)vii)2) Market Effects

- 1. Comment:** In the CARB staff analysis of the economic impact on contractors, there is inadequate consideration of the market effect of the vast numbers of non-qualifying equipment entering the out-of-state market; they use minor adjustments that completely ignore supply-side economic modeling. I believe this equipment would be worth a fraction of staff's anticipated impact. (AGCA3)
- 2. Comment:** ARB has overstated the resale value of the equipment that the proposed rule would prevent fleet owners from using in the future. ARB reasons that California is just one state, and that the equipment inflating a fleet's average emissions could be sold to operators in other states at nearly the same price at which it could be sold today. ARB merely acknowledges that the regulation would "tend to decrease the value of older, dirtier vehicles." Its assumption is that the change in value would be limited to the cost of transporting Tier 0 equipment out of state (which ARB estimates to be \$10 per horsepower). It is not, however, reasonable for ARB to assume that it can eliminate the demand for certain equipment, and simultaneously increase the supply of the same equipment, by an equal amount, without having a dramatic impact on its market value. (AGCA3)

Agency Response: As stated in the response in section 3)d)vii) in this chapter of this FSOR, California represents only an estimated 11 percent of the national off-road diesel vehicle market. Therefore, it is not expected that the value of older equipment in a nationwide market will drop dramatically due to the regulation. As staff acknowledged in Chapter 11 of the TSD, throughout the state there will be greater demand for clean (higher tiered) vehicles and less demand for dirty (lower tiered or unregulated) vehicles. Since staff estimates that off-road vehicles are already purchased and sold in a nationwide (and worldwide) market, fleet owners may buy more new and cleaner-used vehicles from out-of-state (or out-of-country) vendors and bring them into California to operate; conversely, they will likely sell the older, dirtier vehicles that they have to replace outside the state and country where a market will likely continue for such products.

As noted by the commenter, to estimate the potential price impact on both clean and dirty vehicles due to changes in demand, staff estimated a price premium based on the cost to ship sold or purchased vehicles out of and into the state. Staff talked to several heavy haulers of heavy equipment and received cost estimates for moving several types of equipment from California to Texas (assumed to be at the approximate median distance that vehicles would need to be shipped if they had to be sold out of state). The transportation cost from the heavy hauler estimates equated to about \$10/hp, and this cost was added to the price of every vehicle (new or used) purchased for compliance with this regulation. \$10/hp was also subtracted from the value of vehicles assumed to be sold for compliance with the regulation. Staff believes the addition or subtraction of \$10/hp is adequate to address the costs of transporting older vehicles out-of-state, and notes that the commenter has provided no information to dispute this estimate.

To increase the transportation cost to more than \$10/hp based on speculation about estimated future market demand (or lack thereof) would unjustifiably inflate the estimated cost of compliance with the regulation. During the rulemaking process and in these comments, stakeholders questioned the \$10/hp assumption, but have provided no supported alternative. Therefore, the \$10/hp estimate was used to underlie the analysis in the Staff Report and Technical Support Document, and we continue to believe it represents a reasonable estimate.

3)d)viii) Underestimated Repower Costs

- 1. Comment:** A recent quote to re-power a 65 hp engine came to \$53,000 (\$815 per hp). ARB staff estimates for replacing engines are in the \$200-\$250 per hp range. One reason for this high expense is that the new engines will not bolt up to the drive train, necessitating an entire replacement of the drive train. Other requests for quotations have not been returned due to the increased size of the new engines being unable to fit in the existing compartments and/or the necessitation of replacing hydraulic systems, transmissions, cooling systems, etc. (DCCI)

2. **Comment:** Currently there are very few options on the market for contractors like us to meet these requirements other than re-powering existing equipment with new expensive engines that have electronic control systems that are not compatible with older machines. (FCICI2)
3. **Comment:** Upgrading older diesel-powered off-road equipment with Tier 3 devices is not cost-effective. These newer Tier 3 engines require much larger cooling systems, electrical systems for computerized engines, and heavier-duty transmissions, rendering the upgrade of older equipment prohibitively expensive. (GLATKY)
4. **Comment:** The cost to repower equipment is very significant, and most will not be able to afford the costs associated. (MSSE)
5. **Comment:** Re-powering custom equipment used in our operations is either cost prohibitive or currently not manufactured. (MC)
6. **Comment:** The estimated cost to re-power equipment is very low at best. (CUSACK)
7. **Comment:** We have tried to show Air Resources Board staff that their cost modeling for emissions reductions is unrealistic for repowers. In our data we showed that the real costs are in some cases double what the state's data says they should be. (Camarillo6)

Agency Response: Staff acknowledges that repowers can be expensive, and – as documented in Chapter X1, Section C.1.b) of the Technical Support Document - estimate their cost to be an average \$270/hp. The repower cost per hp used by staff is an estimate of the average cost for repowers, and therefore, costs for actual repowers experienced by fleets may be either higher or lower than staff estimates. Although ARB staff originally proposed a lower estimate of average repower costs, the estimate was later raised to \$270/hp based on additional data provided by industry representatives. Also, industry used an approximate value of \$270/hp to estimate repower costs in the M Cubed CICM economic analysis. Additional information about industry's M Cubed CICM analysis and why we believe ARB staff's analysis is more accurate can be found in the responses in section 3c) in this chapter of this FSOR.

Although repowers may not be as cost-effective as a NOx exhaust retrofit, they are less costly than replacing large horsepower vehicles, such as scrapers. As presented in Appendix J of the off-road TSD, a new scraper can cost approximately \$1093/hp. A fleet is not required to repower a vehicle to comply with the off-road regulation; there are many other options, such as vehicle retirement or replacing with a newer used vehicle, that are viable compliance options when repowers are cost-prohibitive or not feasible.

Additionally, staff recognizes that repowering a vehicle with a new engine is not feasible for all vehicle types and horsepower. In the staff's economic analysis, only 3.5 percent of the statewide fleet was estimated to be repowered to meet the compliance requirements of the off-road regulation. Also, because lower horsepower vehicles can sometimes be cost-ineffective to repower, it was also assumed that only vehicles greater than 250 hp would be repowered. A more detailed description of the staff's economic modeling assumptions is found in Chapter XI of the TSD, and in Chapter III-A-10 of this FSOR.

For discussions on repower feasibility, see the responses in section 2)b) in Chapter III-A-2 of this FSOR.

For discussions on why staff believes the regulation will be affordable, see the responses in section 3)a) in this chapter of this FSOR.

3)d)viii)1) Tier 3 Repower Solutions.

- 1. Comment:** In our efforts to pressure one major equipment manufacturer into coming up with more cost effective and Tier 3 repower solutions, we were given the complex issues that they face. They are concerned that they could lose up to a billion dollars in research and development money that they will not be able to recover. The pressure that they are under to come up with Tier 4 technology has given them concerns that the money spent on repowers will be lost because those engines will be obsolete in a few short years. (CAMARILLO4) (CAMARILLO8)

Agency Response: Although we cannot guarantee the availability of Tier 3 and 4 repower solutions, ARB staff encourages manufacturers to develop both Tier 3 and Tier 4 solutions. As presented by staff at the May 25, 2007, Board meeting, a fleet does not need to be comprised of just Tier 4 and Tier 4 Interim vehicles to comply with the final requirements of the regulation; a fleet can comply with a mix of Tier 2, Tier 3, and Tier 4. Therefore, staff agrees that manufacturers should be encouraged to develop Tier 3 repower solutions. A Tier 3 engine repower is a viable compliance option that a fleet may utilize through the end of the regulation. ARB staff will continue to work with the off-road dealers and manufactures to encourage the release of additional Tier 3 repower solutions.

It is also relevant to note that the regulation's specialty vehicle provisions exempt vehicles from turnover if they have no repower available and no used vehicle available that can do the same job.

3)d)viii)2) Large Fleet Repower Costs

- 1. Comment:** We have repowered 72 percent of our fleet today. When you look at the staff report on page 41, they say that if you're a large fleet between the ages of 20 years and greater, that the cost for compliance in

this regulation is between 110 and \$180 dollars per horsepower. It cost us \$330 to repower a 450 horsepower engine. When you have an engine that doesn't marry up to the transmission, then you have to have a transmission. So the cost is different. You have to engineer. You have to cut the frame. You have to put in larger radiators. But we're doing it. We're going from Tier 1, Tier 2, Tier 3. And whenever Tier 4 comes out, we'll go to that. (NWS4)

Agency Response: As documented in Chapter XI of the Technical Support Document, it was estimated that the compliance costs for an average large fleet over 20 years old would be approximately \$110/hp to \$180/hp. However, this cost range represents an average estimate, and is based on a fleet using a combination of repowers, replacement, and exhaust retrofits for compliance with the off-road regulation. If a fleet only uses repowers as its compliance option, the costs are expected to be closer to \$270/hp. A more detailed discussion of the repower costs can be found above in the first response in section 3)d)viii) of this chapter in this FSOR.

3)d)ix) VDECS costs

3)d)ix)1) Expensive VDECS

- 1. Comment:** Aftermarket devices are expensive. (WPC1) (FCICI2) (FCI1)
- 2. Comment:** The rule will require landfills to test and install expensive retrofit devices on our equipment. (MALDONADO1)
- 3. Comment:** For an engine over 600 horsepower, the PM retrofit cost is between \$45,000 and \$90,000 per engine. (MCQUEEN1) (MCQUEEN2)
- 4. Comment:** The most significant objections to the required retrofit devices are the cost of compliance and the time and expense for regeneration. The two Level 3 devices recently verified for many of the covered off-road units, while very effective, are very costly and labor-intensive to maintain. The off-road units equipped with the other verified device require manual regeneration every four hours. At a cost of \$14,000 to more than \$30,000 per diesel-powered engine, these devices can easily cost many times what some of the older machines are worth. Off-road equipment equipped with one of the verified devices must be plugged in regularly for six hours to regenerate. (GLATKY)
- 5. Comment:** VDECS are too expensive to use on larger construction equipment. (NBC)
- 6. Comment:** I installed two HUSS particulate filters on our Caterpillar 988F Loader. This installation took three workers six days to install at a cost of over \$54,000. (ECCO5)

- 7. Comment:** To install a Huss Level III Diesel Particulate Filter on a Tier 0 Cat 3412 and 3408 engine would require three MS100MKL units. The cost would be \$68,047 per machine. (CAMARILLO5)
- 8. Comment:** To retrofit 20% of our horsepower in 2009, it will cost upwards of \$1,000,000. How do we pay for these PM devices? (CAMARILLO3)
- 9. Comment:** Requiring exhaust retrofits on many older pieces of equipment will be too expensive for most small operations and will probably cause many to go out of business. (BENKER)
- 10. Comment:** I will spend more money on retrofitting some of the equipment than I paid for it. (STOWE2)
- 11. Comment:** Your proposal, with the costs of retrofit devices being so expensive, pretty much requires the equipment to be purchased new. (CDTOA1)
- 12. Comment:** The only device currently certified costs around \$60/hp, and this is just for install costs. For an average fleet of 20,000 hp that equates to \$1,200,000 in higher costs for retrofits alone. At 20% of the fleet per year, that gives annual costs of \$240,000. Costs like this will be difficult for companies to absorb and at a minimum reduce the rate of fleet turnover to newer engines. (CBIA)

Agency Response: We agree that for many vehicles, especially large horsepower vehicles, VDECS can be expensive and at times, labor intensive to maintain. (See Table XI-3 in the Technical Support Document for a list of VDECS costs that were used by staff in its cost analysis to support the rulemaking.) However, it is much more cost-effective to use VDECS to reach the PM fleet targets than purchasing newer vehicles, or repowering with new engines. In most cases, VDECS will be significantly less expensive than replacing or repowering a vehicle; staff estimates that many fleets will choose install a VDECS on an existing vehicle, rather than replacing or repowering that vehicle to meet the PM fleet targets. For a more detailed discussion on why PM reductions are necessary, please see the responses in Chapter III-A-1 of this FSOR.

See also the responses in sections 3)a) and 3)b) in this chapter of this FSOR for a discussion of the affordability of the regulation and its impact on affected businesses.

See also the responses in section 6)e) in Chapter III-A-6 of this FSOR for a discussion of the state's efforts to help provide funding assistance and loan guarantees to fleets.

For a discussion on the cost and time needed for filter regeneration, please see section C.1.d) in Chapter XI of the Technical Support Document.

3)d)ix)2) Waste of Money

- 1. Comment:** After-market devices are a waste of money, and do not address the long-term goals of this State. (ECCO5)

Agency Response: We do not agree that PM VDECS are a waste of money. Level 2 and 3 VDECS reduce diesel PM by 50 percent and 85 percent, respectively. As described in Chapter 4 of the TSD, diesel PM contributes to many negative health effects, such as lung and heart disease. PM reductions will result in valuable health benefits such as fewer premature deaths and reduced hospital visits and lost work days by decreasing the number of cases of asthma and other pulmonary diseases (described in Chapter 9 of the TSD). The regulation results in significant savings in health care dollars.

3)d)ix)3) Underestimated VDECS Costs

- 1. Comment:** ARB has grossly underestimated the cost of retrofitting existing equipment. In practice, the construction industry has found that the cost of retrofitting equipment is 50 percent higher than the amount that ARB has estimated. Actual installed costs that contractors are currently paying vary from \$25,000 to \$60,000 per engine. (AGCA3) (CIAQC1) (CIAQC6)
- 2. Comment:** Costs and quotes for VDECS are higher than the estimated costs presented by ARB staff. (GC2) (GC1) (CUSACK) (CIAQC7)
- 3. Comment:** The staff report uses a cost of \$15,000 per tractor. Actual quotes indicate a variable cost averaging about \$28,000 per engine. (RTC)
- 4. Comment:** ECCO was recently required to install a particulate filter on a 430 horsepower 988 loader. These devices cost us \$54,000, not 30,000 as reported earlier by your staff today. (ECCO5) (ECCO6)
- 5. Comment:** The VDECS number is way too low. We're buying them. We know what they cost. They're 25- to \$50,000 apiece. (CBCC3)
- 6. Comment:** The real cost of VDECS today are in some cases over double what the model says they should be. (CAMARILLO1) (CAMARILLO6)
- 7. Comment:** Substantial uncertainty exists over retrofit costs and how those may change over time. (CIAQC1) (CIAQC6) (AGCA3)

8. Comment: As far as the VDECS go, on the Tier 3 motors, it's \$88,000 for the HUSS system for one machine, for four mufflers. And that's going to cost \$5 an hour to maintain the mufflers, also. It's going take a total of six mufflers to put on our Tier 0 scrapers for a cost of over \$120,000. The numbers ARB staff has come up with do not represent us. (CER2)

9. Comment: The table below shows quotes we received for the Huss VDECS.

TABLE I: VDECS Installation Price Quote.

Make, Model, Type	HUSS Model	Unit	Install.	Tax	Total
Cat 623F 6BK 3406C 1994 Hp382	FS200MKL	\$40,923	\$3,200	\$3,172	\$47,295
Cat 988F 3408E 99C 1999 Hp458	FS300MKS	\$48,410	\$3,900	\$3,752	\$56,062

Additional quotations obtained by our industry competitors are in-line with Granite's quotes and reflect that the actual costs will greatly exceed the costs that CARB staff has projected. (GC2)

Agency Response: See responses to section 3)d)ix)1) in this Chapter above. We do not challenge the accuracy of the above quotes or that they are higher than staff's cost estimates. However, for the reasons described below, we believe they do not represent the average or typical costs fleets will pay for retrofits during implementation of the regulation.

First, the prices quoted by the commenters are for a relatively expensive active filter system. As stated in Chapter 11 of the TSD, there are two types of Level 3 (highest level) PM retrofit controls, active filters and passive filters, that are generally available for diesel engines. Active filters require an external source of power to regenerate (burn off the accumulated soot), while passive filters use the heat of the exhaust to regenerate. From a cost perspective, active filters are typically two to three more expensive than passive filters. At the time the Staff Report was written and when the comments above were submitted, the only Level 3 VDECS available off-road applications were active filters. One system, the Huss system, which is an active filter with a fuel burner, has been verified by ARB for use on the largest number of engines, and the quotes submitted by the commenters above were for the Huss system. Because of its relative complexity, the Huss system is two to three times more expensive than a typical passive filter, which should be available in time to be used on vehicles by 2010.

In estimating the retrofit costs of the proposed regulation for the Staff Report and Technical Support Document, the ARB staff analysis projected that by 2010 (the first compliance date in the regulation), passive filters would be available for at least 30 percent of the statewide off-road fleet. Therefore, staff's estimate used both passive and active filters in estimating costs. Since the Board adopted the regulation in July 2007, several Level 3 passive systems including the DCL MINE-X Sootfilter and the Caterpillar DPF have been verified for off-road applications.

Second, we expect there to be more off-road VDECS options in the future, and competition is likely to lower the off-road VDECS prices. The response to

comment 2)a)1) in Chapter III-A-2 of this FSOR discusses why we believe more technologies will be verified.

Third, the costs mentioned by commenters represent quotes in 2007, three years before the regulation's requirements for retrofits become effective, and therefore do not include the economies of scale that are likely to develop when retrofit use becomes more widespread. The regulation is expected to require installation of over 100,000 VDECS, and it is likely that increased production volumes and improved economies of scale from retrofit manufacturers will bring down prices. To be conservative and not underestimate costs, ARB staff did not assume decreases in installed retrofit costs over time. However, if such decreases occur, the actual retrofit costs in the future could be even less than those estimated by the ARB staff.

Finally, when a company receives a quote for one very expensive retrofit, it does not mean the average costs set forth in the Staff Report analysis are inaccurate. Some retrofits are expected to cost more than average and some less.

3)d)ix)4) VDECS Installation and Maintenance Costs

- 1. Comment:** CARB staff has not performed significant research nor does it have reliable data regarding the cost to purchase, install, and maintain retrofit technology. The costs that were encountered for installation of VDECS, and the lack of installation engineering, simply made the installation of these devices an impracticable experiment. (GC2)
- 2. Comment:** Contractors are paying for higher costs for the maintenance, repair and contingent damage to retrofitted equipment. As performance suffers, contractors are also paying for more fuel consumption over the remainder of the equipment's life. Indeed, in many cases, these other costs could well exceed the initial costs of purchasing and installing the devices needed to reduce emissions of PM. (AGCA3)

Agency Response: The costs for VCECS stated in Chapter XI of the TSD included both the purchase price and the installation of the VDECS. Maintenance costs were also estimated. Although we acknowledge that there are costs associated with the maintenance of VDECS, contrary to the commenter's claims, those maintenance costs are not expected to exceed the initial purchasing costs. As stated in Chapter XI of the TSD, an annual maintenance cost (for filter cleaning) of \$400 per retrofit was assumed and a two percent fuel penalty was also estimated for each retrofit installed. Additionally, where active VDEC systems were used (70 percent of the installed retrofits), additional costs for regeneration were estimated. Active filter systems are likely to be electrically regenerated (on or off-board), consume fuel to assist or provide regeneration, or filters will need to be swapped frequently if regenerated remotely. The cost associated with these different regeneration options for active systems varies. The mid-cost estimate is based on electric plug in systems. An off-board

electrically regenerated system must be plugged into an electrical source. If a unit is regenerated three times a week, and consumes 15 kW-hr per regeneration the annual estimated electricity cost is approximately \$375/year.

Additionally, if a VDECS is used and damages the vehicle it is installed on, the warranty, which manufacturers are required to provide per ARB's verification requirements, will cover any damage caused by the VDECS.

3)d)ix)5) Replacement VDECS

- 1. Comment:** VDECS useful life is less than 5000 hours. Most will have to be replacing more than once during the compliance period. (CIAQC7)
- 2. Comment:** VDECS are warranted for 4,200 hours. I have an engine today that has 36,000 hours. How many filters is it going to take to put on that unit? (NWS4)

Agency Response: We do not anticipate that most VDECS will need to be replaced multiple times during the regulation's life. Although most VDECS receive a 5 year warranty, some may last longer than the warranty period.

3)d)ix)6) GSE VDECS Costs

- 1. Comment:** ARB did not examine cost of retrofitting GSE with VDECS. (POHLE)

Agency Response: We acknowledge that we did not treat GSE retrofit costs any different than retrofit costs for any other application. We have no reason to believe costs to retrofit GSE would be any different than to retrofit any other type of off-road diesel vehicle.

Another reason we did not thoroughly evaluate the cost of retrofitting GSE with VDECS is because we anticipate that many GSE fleets will use alternative compliance methods that will not include the use of VDECS. Airline stakeholders told staff several times during the workshop process for the regulation that they prefer to comply without installing retrofits. The off-road regulation contains section 2449(d)(1)(A)3.b., which states that any electric vehicles added to a fleet between 2010 and 2016 will receive double credit (i.e., all electric vehicles added to the fleet will count as double the horsepower with PM and NOx emission factors of zero). This provision, which was added to the regulation at the request of the Air Transport Association, will allow GSE equipment to be replaced with electric vehicles, and potentially lower a GSE fleet's PM averages enough to avoid installing PM VDECS. The electric double credit provision lasts through 2016, at which time Tier 4 vehicles will be available, allowing GSE fleets to upgrade to Tier 4 vehicles that do not require the installation of VDECS.

3)d)x) Record Keeping Costs

- 1. Comment:** The administrative requirements and costs will negatively impact businesses. (OSE)
- 2. Comment:** This does not even take in to account the administrative requirements and costs. The environment in California is causing companies to spend more and more resources on complying with regulations and dealing with tracking and paperwork. (MSSE)
- 3. Comment:** It is recommended that the ARB account for expected record-keeping costs, in addition to annual reporting costs, in their economic assessments. (LACITY)

Staff Response: We disagree that staff did not account for reporting and recordkeeping costs as part of their economic assessment. When accounting for the costs of the regulation, staff included not only the initial reporting costs, but also the costs for the reporting required throughout the implementation of the regulation. Table XI-4 in the TSD presents staff's estimate of reporting costs. As discussed in Chapter XI of the TSD, the reporting costs accounted for work time lost (or the hiring of a consultant) to collect the information necessary for initial, and annual reporting. Most of the records needed for the regulation will be collected for reporting, and there are only minor items (such as VDECS failure and serial numbers) that must be recorded and kept by the fleet, but not submitted to ARB staff. These items will require minimal time to maintain, and are not expected to create additional costs above what has already been estimated as reporting costs.

If a fleet already maintains records of their vehicles (including engine information), the reporting costs for the regulation will be minimal. However, we do acknowledge that for some fleets, it will be necessary to devote time to compile vehicle and engine information from all of their vehicles. However, after the initial reporting is completed, it is expected that the time needed to report the updated fleet information each year will be minimal.

For information about the affordability of the regulation (which includes impacts on business), see the response in section 3)a)i) of this chapter of this FSOR.

3)d)xi) Increased Home Costs

- 1. Comment:** While it is not considered in the discussion of costs, CARB acknowledges that this single regulation will probably increase the cost of new homes by \$1,000 each. This is not insignificant. The total cost was estimated in the range of \$3.0 to 3.4 billion (presumably only to industry) through the years 2009-2030. This does not consider the estimated \$1,000 per home cost increases or the \$5 per month that each homeowner would have to pay in interest. (CEC)

2. **Comment:** CARB is irresponsible if it makes the off road diesel regulation without a true understanding of the impacts on the price of housing. (SHAWM1)

Agency Response: Staff agrees with the commenter that the costs of the regulation are significant. The commenter correctly notes that in the Staff report, staff estimated that the regulation would impose costs in the range of \$3.0 to \$3.4 billion to affected industries. However, the commenter has taken out of context staff's example of potential impacts of the regulation on new home construction.

Staff stated in the Staff Report that it expected some or all of the costs of compliance to be passed through by fleets to customers, thereby maintaining their current profitability. To put into perspective how this cost pass through could impact the customers, staff estimated that if the construction industry's proportional costs of the regulation were passed through to end users, and all of those costs were borne by housing construction, that the impact could mean that new home construction could increase by about \$1,000 per unit. This does not represent costs that are in addition to staff's estimate of \$3.0 to \$3.4 billion.

Staff also agrees with the commenter that it is true that these costs may have a ripple effect throughout the economy. For this reason, the Staff Report also includes a consideration of the total direct and indirect impacts of the regulation on the economy of the State. Using a general equilibrium model of the California economy, staff estimated that the regulation will reduce personal income by less than 0.2 percent in 2010. The impact on housing prices is one of the indirect impacts of the regulation (i.e., it represents one instance of affected fleets passing through compliance costs to their customers). The impact on housing prices will depend on the extent to which affected industries are able to pass through any cost increases to their customers. Thus, although the impact of housing price increases is not specifically identified in the Staff Report, it was part of the staff's estimate of the statewide indirect impacts of the regulation on total employment and the economy.

3)e) Financial Affects

3)e)i) Devalued Equipment

1. **Comment:** Our current equipment will become worthless in the state of California, and there would be such a flood of used equipment in the surrounding states and Mexico that the equipment would be severely devalued. We are already seeing this process happening as we see the auction prices of used equipment drop precipitously. Possibly, their only value would be a scrap metal. (WPC1)

2. **Comment:** What happens to the value of the older equipment when replaced with new? What trade-in value will the equipment retain? (CUSACK)
3. **Comment:** The value of our used equipment will decrease drastically. The approximate current value of our equipment is \$500,000 pre-regulation, and \$0 to \$50,000 post-regulation. (WPC2)
4. **Comment:** Our investment in our equipment will be devalued at an estimated two-thirds. (RRPI2)
5. **Comment:** The equipment that is being retired early is a lot of value on the books that does not show up on the books because it has been depreciated off. That equipment is going to depreciate perhaps 50 percent, 25 percent, to zero, we do not know. But that is money that they were counting on in order to provide down payments for equipment that they're going to need, also to carry them through tough times. If the contractors take a lot of risks, they have to bid on jobs. If it gets difficult, they can either count on that machinery to be there to provide funds through sale of the equipment, or we can loan them money because that equipment has value, and it helps them get cash when they need cash. They need to have cash flow in order to pay for all of this. That is depreciation, profit. (CIT)
6. **Comment:** For the last two years we have been contemplating buying twin engine scrapers to add to our fleet, as they would allow us to bid jobs more competitively. Many times I have evaluated equipment that has become available, i.e. 657B Caterpillar scrapers, which were tier 0. These machines did not show up on the used equipment list very often, and when they did their cost was upwards of \$110,000.00. When the industry started hearing that the finalization of the regulation is drawing close, people tried to get their equipment to auction as quickly as possible, as in the December Ritchie Brothers auction. These scrapers dropped in value by 50 percent, and some sold for as little as \$31,000.00. The financial impact was already being felt. The value of these machines dropped drastically. The closer we get to the finalizing of the off-road regulation, we see prices dropping significantly. (CAMARILLO5)
7. **Comment:** Why make our fleet, in many cases our only assets, valueless overnight with timelines that eliminate the equipment. (AWD)
8. **Comment:** Our equipment will be rendered valueless in California. (KLINE)
9. **Comment:** I think it is common knowledge that the newer equipment is bought and used by those who have more use for it. The older equipment

is bought and used by those who have less use for it. To take the value out of the older equipment inhibits the ability of the owner to upgrade to newer and better equipment. This then is counter productive to what you endeavor to do, which is supersede the older equipment with newer, cleaner equipment. Left alone, this process will occur naturally. To force it invites disaster. (KIP1)

10. Comment: Contractors like myself buy vehicles and hope to use them enough to justify them. In good years we get 400-600 hours of use per machine, in bad years 0 to 200 hours use per machine. If I really see a high use for a machine, I buy new. And what will happen to used equipment values, much of my net worth, if even new machines have only a 10 to 15 year lifespan before they are outlawed? (GREEN)

11. Comment: I have equipment that works very well. It's going to give me a buffer in this recession we're coming in because I don't have payment on everything. And if I sit for a while, I can still survive. As Scott Erreca said, the equipment becomes like a house, or a stock, if you will, in the stock market. But if you create regulation you'd make a market meltdown. And I'm back to zero 20 years ago, with a value collapse. (JANSSON)

Agency Response: We acknowledge that the regulation requires at different times that the oldest vehicles will need to eventually be retired or sold out of state. However, because the regulation phases in gradually (never requiring more than 10 percent of a fleet's horsepower to be turned over in any one year), and because California represents only a small part of the national market for off-road vehicles, we do not believe the value of older equipment will drop dramatically.

Although the regulation may devalue older, dirtier vehicles because there will be less demand for them in California from fleets affected by the regulation, the market for used vehicles is a national and international one, so the regulation will not drive their value to zero. Many vehicles are already sold across state line and international borders. California represents only about 11 percent of the national market for off-road vehicles. Therefore, we expect that older, dirtier vehicles, when assessed, will still maintain the value they are worth when sold out of state. In the economic analysis of the regulation, we estimated the regulation's impact on the value of used vehicles to be about \$10 per horsepower.

Although some vehicle types such as large scraper are more common in California than in other states, staff does not believe these vehicles represent a significant portion of the total off-road horsepower in the state. Therefore, we do not expect large percentage of vehicles will be devalued for this reason.

Comment CAMARILLO5 expresses concern that vehicle prices are already dropping dramatically due to the regulation. We suspect, however, that the current drop in vehicle prices is due to the downturn in construction (noted in many comments, including JANSSON above), rather than due to a regulation that does not impose any actions on fleets for another two years.

Additionally, we do not believe that the regulation will shorten the lifespan of a vehicle (concern expressed by GREEN). As presented by staff at the May 25, 2007, board meeting, a fleet does not need all Tier 4 and Tier 4 Interim vehicles to comply with the final requirements of the regulation; a fleet can comply on the final compliance date with a mix of Tier 2, Tier 3, and Tier 4. Many of the vehicles purchased new today (which are Tier 2 and Tier 3 vehicles) will be able to operate throughout the life of the regulation, and therefore, the lifespan of those vehicles will not be shortened.

Lastly, one stakeholder group solicited an independent review of the regulation, which included a discussion on a fleet's bonding capabilities, and the findings of that review were consistent with staff's assessment described above. The review was conducted by Dr. Neil Eldin, Ph.D., Professional Engineer and is entitled "An Examination of the Construction Industry Compliance Costs for CARB's Off-Road Diesel Vehicle Rule." The review was submitted into the rulemaking docket for the in-use off-road diesel vehicle regulation and is available on ARB's website as comment 21 presented during the Board hearing at www.arb.ca.gov/lispub/comm/bccommlog.php?listname=ordiesl07. Please see Dr. Eldin's review for a list of his professional experience and qualifications.

In Dr. Eldin's review, he states that the regulation will be phased in over several years, and this period of time will allow for the gradual upgrade of the affected fleets. Because the regulation does not require the replacement of the entire fleet at once, newer equipment will be phased in gradually, during which the salvage value of nonconforming equipment should remain unchanged. Additionally, as the equipment upgraded for the regulation ages, these vehicles will pass from the larger fleets to the smaller ones; this will maintain the same historical flow of equipment that is common in the industry.

3)e)ii) Fleet Debt

1. **Comment:** This regulation will force me to either take on new debt trying to maintain compliance or to reduce my fleet size and work capacity, thereby reducing the number of employees I have. (AAI)
2. **Comment:** The costs for larger firms will be greatly amplified with devastating results to their business' health if forced into unmanageable long term debt. (EUCA3)
3. **Comment:** I am concerned that the regulation will substantially increase my debt burden and affect my ability to stay in business and keep people

employed. The construction industry is also highly cyclical and a higher debt burden increases risk and will make it more difficult for average companies like mine to weather economic down cycles. (CBIA)

4. **Comment:** The ARB has not taken into consideration the debt that they are putting the contractor in. (RRPI2)
5. **Comment:** Does CARB staff understand that they are asking equipment owners to significantly increase debt through major equipment modifications or upgrading and at the same time are reducing equipment owner's financial ability? (SHAWM1)
6. **Comment:** All the particulate traps and all that stuff is going to come out of my pocket. And the tractors were legal yesterday. I do not even know if they will be legal tonight. Financially, the regulation is a disaster because what happens is you have the old debt that you got to pay out, and if you people make the tractors not qualify, then you have to get new tractors. But you cannot use the old tractors, and you still have the debt from that. You got to go out and buy some more tractors which are much more expensive than the ones I use. And so it just financially cannot work. (BALALA)
7. **Comment:** Unless you are going to give companies the money they need to pay for compliance, they are going to have to get it someplace. And they are going to have to get it likely from debt. And the problem that happens when you get debt is you have a limited capacity. I have finance contractors, rental yards and dealers, and they all have a debt capacity, a limit on how much they can borrow. Contractors generally can have about 2 1/2 to 1 to 5 to 1 leverage. You go much beyond that and you have to prove that you have some hidden equity. Well, where does that hidden equity come from? It comes from the stuff that you have already owned, that you paid for the most part that has been depreciated. (CIT)

Agency Response: We acknowledge that some fleets may be forced to change their business model and increase their debt to comply with the off-road regulation. As acknowledged on page 159 in Chapter XI of the Technical Support Document, ARB recognizes that compliance with the proposed regulation may be financially challenging for owners of regulated vehicles. Many fleets may have to change how they allocate capital resources, and they may need to borrow money to purchase retrofits and repowers, or to upgrade their vehicles. The amount of debt acquired will depend on the compliance path chosen by the fleet. There are many compliance options, such as vehicle retirement and repowering, which will satisfy the NOx requirements of the regulation without forcing the fleet into the debt associated with a new vehicle purchase. Additionally, renting cleaner vehicles allows a fleet to expand their work capacity while improving their fleet averages without an associated debt. Also, taking early actions, such as

repowering and installing VDECS, are another way to spread out the costs of the regulation without accruing large amounts of debt in the beginning years where the compliance costs can be the highest.

In addition to the Carl Moyer Program, to minimize the cost-impact of compliance, staff is consulting with other state agencies such as the Pollution Control Financing Authority in the State Treasurer's Office and private lenders to look for ways to leverage existing public programs and funding in the private sector, through potential programs such as government loan guarantees, interest rate buy down programs, etc. It is hoped that these efforts could make compliance with the regulation more affordable and access to capital more widely available.

Please see response in section 3)a)i) in this chapter of this FSOR for additional information on the affordability of the regulation.

Please see the response in section 3)g) in this chapter of this FSOR regarding the employment impact of the regulation.

3)e)iii) Fleet Net Worth/Equity

- 1. Comment:** Collateral damage resulting from your regulation would reduce the value of 60 percent of Delta's equipment to essentially zero. This equipment has no market value in California as no one wants to purchase a piece of construction equipment that has an engine that will not be permitted to be used in a year or two. Also, within one year, Delta could not even legally sell this equipment in California. Hauling older equipment out of state hardly is worth the expense, as the flood of equipment leaving California will depress the market value. Delta has been unsuccessful in locating a farmer who needs some paving equipment to overlay his rice patty, so sales to the agriculture industry are moot. Normal resales of equipment from large contractors to small contractors through equipment dealers, assisting new business start-ups, will be prohibited through this regulation. Competition is reduced as required capital to purchase equipment is substantially increased to start or grow a business. When my bank and bonding company realize what you have done to my net worth, Delta most certainly will not be performing to capacity. With just one swift stroke of your pen, Delta's net worth will be substantially reduced. (DCCI)
- 2. Comment:** It is important to note that equipment value for a construction contractor may be a substantial proportion of a firm's total assets. Reductions in the value of this equipment could have substantially negative impacts on a construction firm's ability to remain in business. To the extent that the regulation reduces equipment value – by forcing it to be scrapped, or by flooding out-of-state markets with used equipment, thereby depressing prices – it will act to decrease the market value of the asset—the value of even fully depreciated equipment that still can be

resold at significant prices. Given that some equipment that is used in California has minimal value elsewhere in the country, this hidden value is substantially at risk if state regulations effectively ban its use. Overall the value of a contractor's equipment is a substantial factor in their ability to conduct business. If this value is adversely impacted, construction firms' ability to remain economically viable could be compromised. (CIAQC1) (CIAQC6) (AGCA3)

3. **Comment:** Hidden equity will decline as values decline for all Tier 0 equipment. This could wipe out between 25 to 50% of hidden equity over time. (FAUCHIER1)
4. **Comment:** As a small family owned business, it has taken thirty years to build the small fleet of equipment that we own today. Rome was not built in one day nor was our sweat equity. With the regulation our equity has been cut in half. (TURVEY)
5. **Comment:** You've reduced my equity considerably by making all this Tier 0 equipment -- which my equipment, 60 percent is Tier 0 -- you've reduced the value to basically nothing. It has no market value now. Nobody wants to buy it. (DCCI2)
6. **Comment:** Why is it ok to cut two-thirds of a company's equity? (RRPI1)
7. **Comment:** CARB staff asserts that their regulation will have a negligible effect on owner equity. The truth is that this regulation will destroy construction company equity in an ever-spiraling environment of increased debt and reduced capacity. Particularly in small and minority firms, their equipment equity is all they have. These firms depend upon this equipment-centric net worth for their personal financial security. With the majority of their net worth tied up in equipment that will be devalued due to the regulation, contractors will lose the majority of what they have worked for many years. (EUCA1)
8. **Comment:** The use of capital for this regulation, along with the associated loss of existing equipment equity, will cause hardships for many contractors. (LAMON)
9. **Comment:** We've already lost a very large portion of our equipment equity because of this regulation. It's already happened. This is the same equity that we'd need to pay the bills for the repowers and the replacements that we need to comply with the regulation. (P&S)
10. **Comment:** Like many other companies my equity is tied up in my equipment. The CARB regulation as written will force me to begin replacing or retiring equipment that has been paid for. (AAI)

11. Comment: The in-use off-road regulation would undermine contractors' equity in their construction fleets. First, the regulation would undermine the market for older equipment in California, leading to a deterioration of hidden equity. Second, companies may still owe debt on Tier 0 units (some of which are not very old) that could exceed the equipment's deteriorated value, leading to both a loss on the sale and the need to generate outside cash to retire the debt. Moreover, by deteriorating the hidden equity that a contractor would have relied on to finance new purchases, the ARB regulation simultaneously imposes new costs and undermines contractors' ability to finance. (AGCA3)

Agency Response: As discussed in response 3)e)i) above in this chapter of this FSOR, because the regulation phases in gradually (never requiring more than 10 percent of a fleet's horsepower to be turned over in any one year), and because California represents only a small part of the national market for off-road vehicles, we do not believe the value of older equipment will drop dramatically. If vehicles continue to retain their value, the net worth and equity of a fleet will not be significantly lowered.

Finally, as referenced in the response in section 3)e)i) in this chapter of this FSOR, the review by Dr. Eldin (as submitted by one stakeholder group) states that the regulation will most likely not affect the net worth of affected fleets. On the contrary, as nonconforming equipment is brought into compliance, the value of the equipment (or assets) will increase, and therefore, the net worth of the contractor will continually increase as equipment is upgraded.

3)e)iv) Fleet Credit

1. **Comment:** Let's take a contractor that owns a 1992 300 horsepower excavator. That machine according to staff would be worth \$3,000 less under the new regulation. The machine's worth about \$75,000 maybe. But you've got to replace it with a \$750,000 machine. And somehow in there, that's where sureties are going to be looking at this and saying, "You know what. You don't have the capacity. I don't care what your character is, I don't care how good a guy you are. The numbers don't make sense." (COAT)
2. **Comment:** The regulation could adversely impact construction firms' access to credit as a result of several factors, particularly for small businesses, which tend to have a lower margin for error. Unless a firm's contract includes adjustments for price escalations they will either have to "eat" the cost of these price increases through profit reductions, or attempt to terminate the contract. In either case the firm's underlying economic health would be impaired, weakening their ability to gain access to good credit terms and remain viable in the marketplace. Firms that elect to replace older equipment with government-sanctioned models will either

need to dip into their cash reserves or obtain loans to pay for the new capital. If relying on cash results in a significant decline in available reserves, it could lead to increased borrowing costs. (CIAQC1) (CIAQC6) (AGCA3)

3. **Comment:** The rule will affect the ability to borrow money to finance equipment. (FAUCHIER1)
4. **Comment:** Contractors (particularly small firms) have to use short-term credit lines to finance operations. Construction lenders use company's balance sheet; cash flow; existing debt load; and year-to-year profitability to determine credit access. To the extent that the CARB regulation reduces the value of existing equipment, which CARB agrees will happen, it will decrease the balance sheet portion of this asset class. (EUCA1)
5. **Comment:** Old equipment is unusable and old debt remains, new debt can't be obtained because of inability to pay off old debt. (CDTOA1)
6. **Comment:** We had a meeting with staff to show our actual cost numbers. Staff presented me with a cost of compliance for the first year of \$2.1 million. Staff expects us to borrow \$2.1 million a year for three to five years to finance compliance. We are not foolish enough to borrow money to purchase VDECS or diesel particulate filters, which after one year, have no value. Now that is because there is no resale market, as confirmed by staff at our 16th meeting. There is no resale market for VDECS. So lenders, commercial lenders are equity lenders. They lend on things that retain their value, not something that has a value one day and is gone the next. Or, purchase new equipment that cannot pay for itself. We and many others think our words have fallen on deaf ears. Our time has been wasted. (DER7)
7. **Comment:** California contractors base their borrowing power on their asset base and every banker in the US knows this. This regulation will have a significant negative impact on the contractors' net worth, borrowing power, bonding capabilities and ability to bid competitively. This alone in many cases will force the small owner operator out of business either from the lack of funding from a loss in asset net worth or the inability to come up with the cash capital required to fund a job. (MCDONALD)
8. **Comment:** Reductions in a firm's equipment value would serve to lessen the firm's net worth, with a concomitant decline in their ability to obtain good borrowing terms, and more importantly, reduce borrowing and bonding capacity for investing in such things as new, cleaner equipment. (CIAQC1) (CIAQC6) (AGCA3)

9. Comment: Retroactive emissions limits, imposed on equipment already in use, could render a company's fleet prematurely obsolete. Such dramatic action deprives a company of its ability to bond or bid work, or to borrow money. For many construction companies, the proposal would wipe out their balance sheet overnight. These companies would no longer be able to borrow money because contractors rely on the value of their current equipment to finance their purchase of new equipment. (PILCONIS) (AGCA3)

Agency Response: We acknowledge that the compliance costs of the off-road regulation may affect a fleet's net worth and ability to borrow money. However, we do not expect this effect to be dramatic or catastrophic.

Although there will be less demand for older, higher-higher emitting vehicles in California because of the regulation, the market for used vehicles is a national and international one, so the value of these vehicles should not be drastically affected. Many vehicles are already sold across state line and international borders. (A representative from Ritchie Brothers testified to this fact at the July 26, 2007, hearing, in fact.) California represents only about 11 percent of the national market for off-road vehicles. Therefore, we expect that older, dirtier vehicles, when assessed, will still maintain the value they are worth when sold out of state. In the economic analysis of the regulation, we estimated the regulation's impact on the value of used vehicles to be about \$10 per horsepower.

To address this concern that fleets may have trouble borrowing funds to use to help pay for compliance with the regulation, staff is consulting with other California state agencies and private lenders to look for additional ways to leverage private sector funding with existing public programs, utilizing potential programs such as government loan guarantees, interest rate buy down programs, etc. It is hoped that these efforts will make compliance with the regulation more affordable and access to capital more widely available. Please see the response in the next section, section 3)v) in this chapter of this FSOR, for a further discussion on the regulation's effect on bonding capacity.

Smaller fleets and businesses have less stringent requirements for compliance with the off-road regulation, and are not required to turnover any vehicles for the regulation. We acknowledge that some smaller fleets may have problems accessing credit for VDECS purchases; therefore, staff is initiating a pilot project which would direct funds to guarantee loans for fleets to purchase exhaust retrofits to comply with the regulation. Please see the response in section 3)iv)1) in this chapter of this FSOR for a further discussion on the pilot program.

Additionally, we believe that there may be a resale value for used VDECS, and a used market for VDECS may develop during the early years of the regulation. A fleet owner is allowed to re-use a VDECS, as long as the original vehicle used

with the VDECS is no longer operating in California. Therefore, for all vehicles scrapped or sold out of state, the VDECS for those vehicles could be used within the same fleet, or sold to another fleet as a used VDECS.

Finally, the Board has directed staff to return to the Board with periodic updates on the progress of implementation over the course of the regulation's life. As part of those updates, staff will apprise the Board of issues such as the ability of fleets to implement the regulation's performance requirements.

3)e)iv)1) VDECS Loans

- Comment:** We have given ARB staff a letter from our financial institution declining to finance DPFs. It states in the letter that it is impossible to provide the financing since the VDECS become part of the machine that they are attached to. This would inhibit the institution from perfecting a lien against the collateral in question. (Camarillo1) (Camarillo3) (Camarillo5) (Camarillo6)

Agency Response: We acknowledge that during the regulation process, several fleets found that financial institutions are unwilling to provide loans for VDECS. To address this issue, staff is initiating a pilot project which would direct funds to guarantee loans for fleets to purchase exhaust retrofits to comply with the regulation. If the pilot program is successful, it is envisioned that the loan guarantee program could continue indefinitely, as long as funding is available and the program continues to be utilized. We also expect that as the regulation is implemented and as hundreds of fleets begin purchasing VDECS, that financial institutions will become more familiar with VDECS and the requirements for their use and will become more comfortable lending for VDECS.

Please see the response in section 6)e)x) of Chapter III-A-6 of this FSOR for a further discussion on the pilot program.

3)e)v) Bonding Capacity.

- Comment:** When my bank and bonding company realize what you have done to my net worth, Delta most certainly will not be performing to capacity. Not only will this be due to the forced "retirement" of perfectly good equipment, but because of our reduced bonding and borrowing limits. Growth is out of the question. Perhaps reduction in industry capacity is the real purpose of this regulation. (DCCI)
- Comment:** Retroactive emissions limits, imposed on equipment already in use, could render a company's fleet prematurely obsolete. Such dramatic action deprives a company of its ability to bond or bid work, or to borrow money. ARB has also neglected its proposal's negative impact on a company's financial strength, and in turn, its bonding capacity, and ability

to bid for new work. Most construction companies have few capital assets, other than the equipment they own. ARB's rulemaking documents fail to account for the fact that contractors recover the cost of equipment investments over time. To impose a huge retrofit, repower or replacement cost all at once would cause significant financial problems for contractors, particularly small businesses. For many construction companies, the proposal would wipe out their balance sheet overnight. These companies would no longer be able to borrow money because contractors rely on the value of their current equipment to finance their purchase of new equipment. (PILCONIS) (AGCA3)

3. **Comment:** The regulation may decrease the bonding capacity of California contractors due to added debt and decreased working capital and an influx of out-of-state contractors obtaining profitable work while their balance sheets and bonding are intact. (FAUCHIER1)
4. **Comment:** As contractors reduce their fleets to comply, their asset bases and their ability to bond are correspondingly reduced. (CIAQC7)
5. **Comment:** The restrictions on adding vehicles in 2449(d)(7) will further reduce the bonding capability of owners because they will cause used machines to be sold for far less than their book value. (CIAQC3)
6. **Comment:** Who is going to "pay" for equipment owner's equity loss due to regulations? Even now, due to the proposed regulations, the market value of all except the newest equipment is plummeting. Owner's are currently experiencing a real loss of net worth on their balance sheets that has a direct affect on their ability to borrow money (credit lines) and their ability to bond. This will accelerate as the impact of these regulations becomes widespread. (SHAWM1)
7. **Comment:** Companies that own mostly Tier 0 equipment do so because they do not have the capital required to update their fleet. The proposed regulation will put them out of business, and even if they are fortunate enough to come up with the required capital, the added debt will create serious problems with their bonding capacity. (ESCOBEDO)
8. **Comment:** Revenues fall within the range of what the State of California considers a small business enterprise. Through the years, one very critical element of my business' longevity has been the balancing act of controlling long term debt. Staying within operating ratios that allow my company to maintain bonding capacity and have an accessible credit line is crucial to my business health. (EUCA3)

9. Comment: Contractor bonding, required to be able to bid for work, is based on net assets. The equipment devalued by this regulation will have a directly proportional affect on bonding capacity. (EUCA1)

10. Comment: Capriciously slashing equipment value slashes the value of the construction company itself. This, in turn, slashes their ability to bond, subsequently limiting their ability to do business. (VCE1) (PCCA)

11. Comment: Reductions in a firm's equipment value would serve to lessen the firm's net worth, with a concomitant decline in their ability to obtain good borrowing terms, and more importantly, reduce borrowing and bonding capacity for investing in such things as new, cleaner equipment. (CIAQC1) (CIAQC6) (AGCA3)

12. Comment: The other thing that scares me about this regulation is that, like any other company, we have built up over the years and our equity and ability to bond for jobs is wrapped up in that equipment. (AAWC2)

13. Comment: ARB has failed to account for the rule's inevitable impact on construction contractors' borrowing and bonding capacity. As explained, the rule would dramatically devalue Tier 0 and Tier 1 equipment. In the process, the rule would make it far more difficult for contractors to raise cash. At the same time, the rule would limit a contractor's bonding capacity, making it much more difficult for the contractor to grow its revenue. The regulation would also weaken small business' capacity to bond, thereby weakening their capacity to bid on and obtain the work needed to pay the costs imposed by ARB's rule. Financial experts maintain that smaller contractors are more likely to use their maximum bonding capacity and, as a general rule, have more difficulty passing on some of their costs to customers. Based on AGC's experience working with its members on diesel retrofit issues, it has learned that small businesses tend to own older equipment due to a slower turnover rate in their fleets. ARB's regulation would undermine the market for older equipment in California and out-of-state, leading to a deterioration of hidden equity. In addition, small companies may still owe debt on Tier 0 units (some of which are very old) that could exceed the equipment's deteriorated value, leading to both a loss on the sale and the need to generate outside cash to retire the debt. Based on this scenario, small businesses are less likely to have the capacity to raise or borrow the cash needed to finance new purchases that would be required by the ARB proposal. A contractor that does not use all his bonding capacity often does so as a matter of choice- they prefer a stronger financial position. Staff's position that this "excess capacity" will be used to meet these requirements infringes on business owner's rights to establish their own financial business model, and clearly directs them to operate at a greater financial risk. (AGCA3)

14. Comment: If there is too much debt, they're not going to be able to bond jobs. Without the working capital, the companies are not going to get the bonding that they need. The working capital means if you continually add debt, your working capital's going to decline. As your working capital declines, your bonding will decline. You'll be unable to bid on the projects you're supposed to bid on. And you need those projects in order to get the money that you need to buy the equipment. It's all linked. (CIT)

15. Comment: Our DPW indicates that the regulation will reduce the value and number of older equipment pieces currently in construction companies' inventories. Equipment inventories are used as one of the key factors by construction bonding companies in determining whether or not a company is bondable and for what amount. The DPW reports that this rule may impact affected companies' ability to bond, the number of and value of pieces in their inventory and thus their ability to bid on public works projects. Therefore, the City recommends assessing how replacement of equipment, potentially de-valued by the regulation, would impact the described process and these firms' ability to response to the City's request for bids. (LACITY)

16. Comment: Along with that, we have shown that our Tier 0 equipment has been devalued by 75 percent. This represents our down payments, and on newer equipment. This has severely changed our debt to asset ratio and bonding capability. (CAMARILLO4) (CAMARILLO8)

17. Comment: I would like to emphasize that the regulation would sharply cut the value of existing fleets – wiping out the net worth of many construction companies, depriving them of their bonding capacity, and simultaneously requiring them to make massive capital investments. (CEI2)

Agency Response: See Agency response to the comments in section 4 above. As noted in the Chapter XI of the Technical Support Document, we acknowledge that lowering the equipment value of the contractor can result in lower working capital and can have a negative impact on a contractor's ability to obtain performance bonds. However, as noted above in the response in section 3)e)iv), although the regulation may affect the demand for older, dirtier vehicles in California from fleets affected by the regulation, the market for used vehicles is a national and international one, so the regulation will not drive their value to zero. Many vehicles are already sold across state line and international borders. California represents only about 11 percent of the national market for off-road vehicles. Therefore, we expect that older, dirtier vehicles, when assessed, will still maintain the much of their value when sold out of state. In the economic analysis of the regulation, we estimated the regulation's impact on the value of used vehicles to be about \$10 per horsepower. Because the value of older

vehicles will only drop a small amount, we do not expect the effect on contractors bonding capacity to be dramatic.

In addition, many contractors do not request or utilize the maximum bonding amount for which they would qualify, and will see little to no effect from the cost of regulation. If a fleet is not willing to change its business model to comply with the regulation, it may have to downsize to meet the compliance requirements of the regulation, or find other lost cost options for compliance. Smaller contractors are more likely to utilize their maximum bonding capacity, and may have the most difficulty passing on the cost of regulation, and therefore have the most potential negative impact on their bonding capacity due to the regulation. However, the provisions in the regulation for small and medium fleets are specifically implemented to lower the negative financial impact on these businesses and will aid in reducing any adverse impact on their bonding ability.

3)e)vi) Passing on Costs

- 1. Comment:** ARB has exaggerated the market power of any one construction contractor. Collectively, the nation's contractors wield great economic power, but their industry remains highly fragmented and intensely competitive, and few if any of them have the power to compel their clients to absorb the cost of compliance with the regulation. Those performing highly specialized work may be able to build a portion of that cost into their bids and quotes, but most contractors will have to bear all of it. ARB has to assume that some firms can and will choose to absorb the cost of compliance, and that competition will therefore prevent most contractors from passing that cost along to their clients. It became apparent that ARB staff, including ARB's economist, did not understand (a) that ARB's regulation would affect different contractors differently because they operate in a competitive-bid environment where the company with the better cost structure has an advantage; (b) that contractors in competitive-bid environments cannot simply pass their increased costs through to their customers; and (c) that contractors must bond for the full amount of their contracts. Staff's comment that a significant portion of costs could be passed along to customers does not give adequate consideration to the "low bidder" competitive market, and the disproportionate effect on different contractors competing in the same market. Companies can not pass the full cost of equipment retrofit or replacement on to the construction-funding agencies and private customers in a competitive bid environment. This will be especially true under a competitive bid contract that is usually prepared on a fixed price basis – as is typical with public works projects. (AGCA3)
- 2. Comment:** In the Staff Report, CARB staff has stated that fleets will have to pass through at least some of the costs to their customers in the form of higher services to maintain their profitability. During the last round of workshops, CARB staff reported for the first time that companies will have

to increase their revenues 2% to 4% to cover the cost of the regulation. In all the workshops, stakeholders expressed to CARB staff that the cost associated with the regulation cannot be passed on to their customers. (NWS)

3. **Comment:** My company is feeling the crunch, and the added cost to retrofit my equipment can not be passed on to my customers. (SE)
4. **Comment:** In the 80 page regulation there is a suggestion of layering costs, which is to "pass on costs to customers" (i.e. taxpayers) – this is a mentality that must end. (BENTE)
5. **Comment:** The construction industry will have to bear very large portions of the regulation cost: Construction firms would bear 54 percent of the added costs. The US EPA provided estimates in its Regulatory Impact Analysis for its off-road regulations in 2003 and construction firms bear 49 percent of the regulatory costs. We derived the share of costs to that are likely to be borne by construction firms from the new regulations. Based on two different studies, these firms will absorb about half of these costs, unable to pass them through to customers. A portion will be realized in reduced profits, while the remainder likely will result in lost jobs in the sector. (CIAQC1) (CIAQC6) (AGCA3)
6. **Comment:** The staff estimate is basically assuming that the industry can pass through 90 percent of the costs to customers. In fact, U.S. EPA and other sources estimate only about 50 percent can be passed through. (CIAQC10)
7. **Comment:** The idea of that cost being passed on to the customer does not sound realistic from my experience. Not all users can just raise their rates, such as government agencies. (EDC-DOT)
8. **Comment:** Government and politicians think it is just a matter of passing along our costs to the customer, which if we could, that would be bad enough on the economy, but in the real world of private business, it does not work that way. In the real world of competition in the private sector, you are bidding against "all comers" and unlike the monopolies of government; you rarely can pass anything on. (LITTEN)
9. **Comment:** While attending several meetings and hearings on this issue, representatives from the CARB staff said that in order to recover the financial impact that would be imposed on each of our companies as a result of complying with the regulation, "You (the contractors) will just simply have to raise your bid prices. " We will be the first to tell you; it does not work like that. We bid on a competitive basis and raising our prices would make it extremely difficult to compete since other contractors won't

be spending retrofit money at the same rate. Additionally, there will be contractors who are slower to comply and consequently will be able to use lower bid rates for a longer period of time. Not all contractors will be retrofitting their equipment at the same rate and yet another group of contractors will be forced out of business because they can no longer bid competitively. Due to the present economic situation in this state, it is very difficult to even have your bid accepted. Our backlog is very low at the present time due to our inability to secure work even at the low numbers we use to bid jobs. We would like for you to tell us how we can survive at all if we raise our rates. (PPC)

10. Comment: The cost of doing business in this great state is already through the roof. Consumers already balk at current rates due to insurance cost, and fuel prices. If we are expected to pass the cost along to consumers there will be considerably less consumers which mean fewer contractors to service them. I think that I would rather sell my diesel powered machines and replace them with older, less productive, more pollutant gasoline powered equipment to save cost and stay out of the new regulations. (WTTC)

11. Comment: Your regulation states that we will simply pass on all of these costs. I have been in business for 11 years and if you deduct the fuel cost are hourly rate has dropped 5% with labor going up 25%-30%, parts 40%-80%, Tires 100%, Insurance 45%. This bill will put me out of business. (CER)

12. Comment: CARB tells the industry to pass along the costs of its regulations (\$3.4 billion in direct cost and \$16.1 billion in equipment replacement) to their customers—public and private. CARB erroneously assumes that increases in revenue drop straight to the bottom line, whereas industry knows that actual costs such as labor, materials and overhead have to come out of revenue streams before the resulting profits can be used to acquire new equipment or retrofit existing machines. (EUCA1)

13. Comment: One of the uniquenesses we have is that our prices are not set by bids. Our products are low cost and they are dependent on transportation. We cannot ship very far. We're one of the very few handful of mines left in California that produces this material, and we have very long term price commitments with our customers. They are in glass manufacturing, farmers. So we believe that the estimates that you've heard today don't apply to us in terms of the ability to pass on costs. We want to continue to supply our customers, but we have deep concerns about being able to raise prices enough to see us through this regulation. We do not set prices by bids that can change with every job. We have

long-term contracts, five or ten years, with only small escalation factors built in. (BMM3)

14. Comment: Staff indicates that these costs will merely be passed on to the project owners and consumers, however that is not an immediate return on the subcontractor's investment and may in fact never be recouped. (ASA)

15. Comment: Being a rental company, we gross about five to five and a half million dollars a year. I just received some Carl Moyer funds. It is going to cost \$1.7 million to repower 25 percent of our machines. So I don't know how adding one percent is going to cover our cost. I really think the rental companies are getting the short end of this deal, because we can't add on to our bids. We're just stuck with our base rental base. (CER2)

16. Comment: Another good example of how outlandish this concept the ARB is proposing. Imagine if an unelected by popular vote, government agency put into law a requirement that stated all houses and buildings that were built more than 2, 3, 4, or 5 or say 15 years ago, are no longer permitted to exist. They are a source of pollution, they are energy inefficient, they cost too much to supply with electric and gas. The energy plants that are required to keep these homes operating are too numerous and are polluting the planet. And the only way to solve this was to dismantle all the non conforming houses and buildings, and build new ones. The individual home owners and building owners would just have to foot the bill for this. But in order to pay for all these things, all these individuals (according to the ARB published cost example regarding the expense of their regulations) would only need to get a 3% raise from their employers or customers to cover the expense of replacing everything. Do you think a 3% raise in your income would cover the expense of these requirements? Yet that is what the ARB is claiming. (PB)

17. Comment: Contrary to ARB's assumptions, contractors will not be able to pass-through compliance costs. Construction is a highly competitive business. Most construction contracts are awarded on a "low-bid" basis. A job can be lost over a \$1,000 difference in bids. Contractors often bid jobs at or below cost in order to keep their employees working and recover basic operating costs. Any contractor who has spent substantial dollars to purchase new equipment will be at a distinct disadvantage in the bidding process. If it tried to recover those costs, its bids would be higher than those of his competitors. (CIAQC7) (PILCONIS) (AGCA3)

18. Comment: I must comment on the statement that the retrofitting, etc. could be financed by a "small" increase in revenue (0.1% to 4%) adequate to cover the cost of compliance. What a cavalier attitude! Unlike

governments of this State and Country the private enterprise system can not increase revenue through taxes and fees! (HBE)

19. Comment: I have heard ARB talking about passing this cost on to your competitors. I'd like to tell you what happens in the real world. When you walk into the marketplace, you walk in to get bid on your portion of that business. And while you are there, you are like me, a large fleet. And there beside you is a medium fleet and a small fleet. And we are going to pass this cost on to these people. As a large fleet, you will not pass the cost on until five years, whenever the field levels and it is a level playing field for all, then you can pass on the cost. (NWS4)

20. Comment: CARB should confirm the ability of such operators to absorb compliance costs. (CBIA)

21. Comment: County road departments do not have service fees or charges to increase, from which these funds could be derived (RCRC)

22. Comment: Construction is on a competitive bid basis, and only a portion of cost can be passed through. (FAUCHIER1)

23. Comment: Anybody who has been in construction knows that this is an extremely competitive industry in the state of California. Our jobs are won by dollars, not by tens of thousands or hundreds of thousands of dollars. So if we try to pass on the cost of new equipment to the customer, we will simply bid ourselves out of a job. (AAWC2)

24. Comment: In Fresno County collectors were allowed in that area for the on-road vehicle project to pass through increased costs. However, there were around 30 percent of the folks who were denied and that is a little bit difficult because our expectation and your staff's expectation is that, in all cases, industry will figure out how to pass it through. So just as an indicator of the on-road project, we have had some successes and some lack of success. (CFC)

Agency Response: As stated in section G.2.a. of Chapter XI of the Technical Support Document, staff expects that overall, most affected businesses should be able to absorb the costs of the regulation with no significant adverse impacts on their profitability. Manufacturing business are the least likely to be able to pass on their costs if the product they manufacture is sold nationally or globally. But, because the economic impact of the regulation is not expected to be a significant part of their normal operating expenses, staff does not expect this impact to be significant.

However, staff believes that most construction fleets, rental companies, airlines, and landscaping service fleets who compete locally should be able to pass on

some or all of the costs of compliance to their customers, thereby maintaining their profitability. Even if fleets were unable to pass on any of the cost of compliance to their customers, staff found that between about 60 and 80 percent of fleets would still be expected to be able to withstand the cost of the regulation without incurring more than a 10 percent change in their return on equity. Small fleets would be more likely able to absorb the cost of the regulation without exceeding 10 percent change in “return on owner’s equity” (ROE) because they are not subject to the regulation’s mandatory turnover provisions, and thereby would incur significantly less costs relative to medium and large fleets. The 20 to 40 percent of fleets for which the regulatory costs exceed a 10 percent change in ROE would have to pass through at least some of the costs to their customers to maintain their profitability.

Additionally, as referenced in the response in section 3)e)i) in this chapter of this FSOR, a review by Dr. Eldin, a professor and head of the department of construction technology at the Purdue School of Engineering and Technology (as submitted by one stakeholder group), concludes that there is no reason for the affected fleets not to pass on the costs of compliance to their customers. The affected industries have had to pass on other costs in the past, such as increases in insurance, bonds, labor, fuel, and materials. Commenter WTTC suggests that this has already occurred. Like these other costs, the costs of the regulation are a direct cost item, and should therefore be able to be passed on to customers. Even commenters CIAQC and AGCA, in their comments above, recognize that some compliance costs can be passed on to customers; they estimate that half of costs can be passed through.

We recognize, as noted by commenter NWS4, that large fleets face compliance requirements earlier than medium and small fleets and that in situations where large fleets compete with medium or small, large fleets may find it difficult to pass on costs. However, in weighing this situation, the Board decided that the reasons to provide less stringent requirements to small and medium fleets were so compelling that they outweighed the impacts to large fleets. For further discussion of this issue, please see the responses in section 6)b)iv) in Chapter 6 of this FSOR.

Comment: Most contractors operate with profit margins between 2% and 5%. With a profit margin of 4%, it would require them to complete \$25,000,000 of work to be able to replace \$1,000,000 of equipment. CARB has suggested that contractors should just build the cost of the new equipment into their prices. That might make some sense if everyone used published prices, but is amazingly naive for contractors. The public contract code and other laws and regulations prohibit collusion in bidding public work. Under CARB's regulation, contractors who wait the longest to replace their equipment would be able to underbid the contractors who quickly replace their equipment, driving those who did what you wanted out of business. Your regulations are counterproductive at best. (EUCA)

Agency Response: We acknowledge that some fleets may wait until the last minute to comply with the regulatory requirements; however, the bidding advantage those fleets may experience will be short-lived. Many fleets will choose to comply early to spread out their compliance costs, and therefore, will be passing only small amounts of their compliance costs onto their customers at any one time. Fleets that wait until the last minute to comply will most likely experience a large peak in their compliance costs, and will be forced to pass a large amount of these expenses onto their customers all at once. Although fleets that wait to comply may have an advantage in the initial stages of the regulation (as they pass along no costs, while early compliant fleets pass along a little cost), this advantage will only occur for a short time.

3)f) Increased Costs

3)f)i) Increased Equipment Costs

- 1. Comment:** Prices for new equipment with higher tier engines will rise dramatically. With the demand for high tier engines increasing and the supply relatively fixed, dealers will increase prices to allocate scarce equipment among their customers. (AE)
- 2. Comment:** Replacement equipment will be scarce and those vehicles will have inflated values. (CBC)
- 3. Comment:** The regulation will increase the cost of the equipment. Firms accustomed to paying lower prices for second- or third-hand equipment – with associated access to available credit – reflecting the partially depreciated nature of used equipment, will be forced to noticeably increase their expenditures on a given piece of equipment. (CIAQC1) (CIAQC6) (AGCA3)
- 4. Comment:** Given the rules of supply and demand, the cost of this equipment during the compliance period will likely inflate dramatically. We feel this is a serious limitation that should be addressed. (RJB2)

Agency Response: We do not agree that all vehicle prices will increase dramatically. As explained further below, we do not expect the demand for new vehicles, or the prices for new vehicles to increase due to the regulation. We do expect the regulation will increase the demand in California for newer, used vehicles. However, California is only a small part of the national market for used vehicles. Accordingly, we expect there to be a sufficient supply of both new and used vehicles to be available so that the prices should not increase dramatically.

The regulation would impose upon different fleets different increments of increased turnover depending upon the average age of the fleet. Utilizing data from 200 fleets actually operating in California, staff modeled the turnover these fleets would incur to comply with the regulation from 2010 through 2020. Based

upon this model, staff have estimated the natural turnover rate for the 200 fleets in the absence of the regulation and also estimated the average turnover rate for the 200 fleets when complying with the regulation.

As shown in Figure III-A-3(f)i)-1, we expect that newer fleets, those with an average age of zero to eight years, that already have a high rate of vehicle turnover would not need do any additional turnover under the regulation. On the other hand, to comply with the regulation older fleets with average age 16 years and older will need to do significantly more turnover than they normally do. In the figure, the grey line represents the amount of natural turnover that occurs by fleets of varying age, and the black line represents the increased amount of incremental turnover that will be necessary to comply with the regulation.

Figure III-A-3(f)i)-1 - Vehicle Turnover Rates

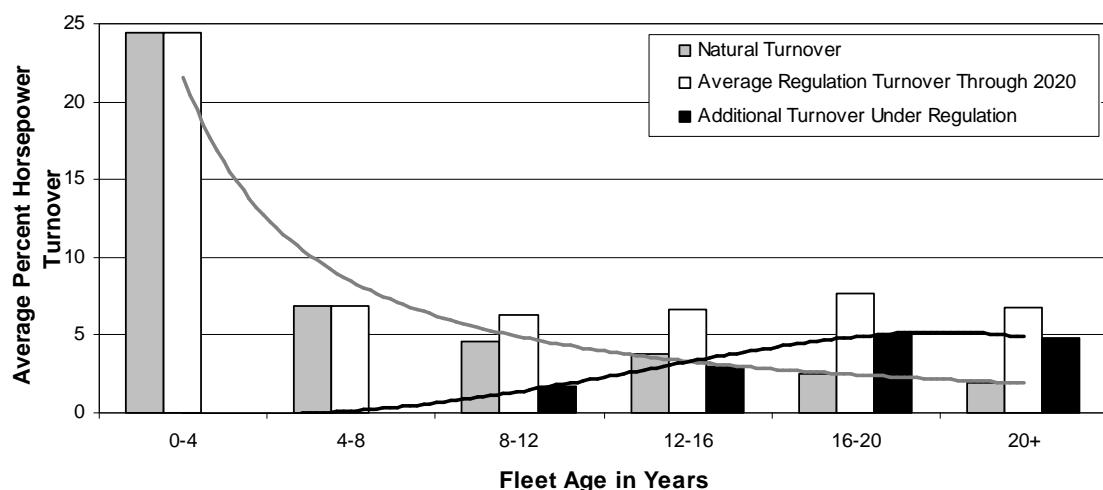


Table III-A-3(f)i)-1 below provides the same data (rounded) as Figure III-A-3(f)i)-1 in tabular form. It also includes the percent of total statewide horsepower that the fleet average age bin represents and the replacement vehicle age. As discussed in Appendix H of the Technical Support Document, staff modeled newer fleets purchasing new vehicles and older fleets purchasing used vehicles with replacement vehicle age as shown in Table III-A-3(f)i)-1.

Table 3(f)i)-1 - Vehicle Turnover Rates

Fleet Age in Years	Percent Natural Turnover	Percent Average Rule Turnover Through 2020	Additional Turnover Under Regulation	Percent of Total Statewide Horsepower	Replacement Vehicle Age Modeled
0-4	24	24	0	1	0
4-8	7	7	0	16	0

8-12	5	6	2	34	1
12-16	4	7	3	28	2
16-20	3	8	5	17	3
20+	2	7	5	4	4

As modeled, staff estimated that there would be little or no additional demand for new vehicles resulting from the regulation. Staff recognizes that older fleets may choose to buy new vehicles rather than their more typical practice of purchasing used vehicles and this would represent an increase demand for new vehicles. However, on average, staff believes that older fleets faced with the requirement to turn over additional vehicles would choose the least-costly option of buying slightly newer, cleaner used vehicles instead. Thus, we expect the demand for new vehicles and the prices for new vehicles will not increase appreciably.

However, as shown above, staff expects that the regulation will produce a greater demand for newer, used vehicles. As explained further in the response in section 2)g) of Chapter III-A-2 of this FSOR, we expect there to be an adequate supply of used vehicles to meet this increased demand. Also, because California only represents around 11 percent of the national market for off-road vehicles, we do not expect the increased demand in California to have a significant impact on prices. Therefore, we do not expect the prices of those used vehicles to increase dramatically.

For a detailed discussion on fleets' equity and access to credit, see the responses in section 3)e) in this chapter of this FSOR.

3)f)ii) Increased Costs in California

1. **Comment:** The regulation states that this will accelerate turnover to newer, cleaner engines - this is in an ideal world! Many big fleets may be able to accomplish this. But they will definitely have to pass on this increased cost in higher operating charges. This will in turn, affect costs to consumers all down the line. (BENKER)
2. **Comment:** You will raise the cost of doing nearly anything in California out of the reach of more and more people. (PB)
3. **Comment:** The regulations will cause the cost of construction to double, hurting the home buyer as well as the tax payer. (TURVEY)
4. **Comment:** It is easy to understand that even if only the largest companies, i.e. the largest producers, were forced to replace or re-power their equipment, then the cost will ultimately be passed on to the consumers. (MARTIN)

5. **Comment:** I foresee a significant slowing in the construction industry, significantly higher costs and almost certain job losses. As usual, the government has not fully studied the impact their decisions will have on ordinary Californians. (J&M)
6. **Comment:** As equipment prices rise, so will the prices of all goods for which construction is an input. The cost of living and home-ownership, already well ahead of the national average, will rise further and faster than the rest of the country where these regulations are not in effect. (AE)
7. **Comment:** Contractors will spend billions of dollars to implement the requirements, which costs will be passed on to the customers, who include public agencies, which will then be passed onto the taxpayers. (GHILOTTIBC)
8. **Comment:** State and local taxes will have to be raised to compensate for all of the lost contractor revenues. (BING)
9. **Comment:** Based on the economic impact figures that we've seen presented to us, we are alarmed, very alarmed at the potential cost increase to our industry, cost increases to housing, to offices, to business growth, to roads, schools, parks -- everything essentially associated with economic growth in the state. And that's one of the biggest concerns we have with the analysis that CARB staff has presented. (BIA-SD1)
10. **Comment:** The indirect impacts, the cost of these regulations will increase the cost of constructing housing, office space, and retail space. It will have a major impact on development impact fees. Development impact fees for everything from schools, parks, roads, public facilities, sewer and water, everything that is infrastructure related will go up, which will also be reflected in cost of building homes, offices, and retail. We are very concerned about this given the state of affordable housing in this state. We're also very concerned about these cost increases due to the fact that our climate is not particularly considered business friendly at this point. It's very difficult to be a successful business in this state. (BIA-SD2)
11. **Comment:** The public will not accept or understand the increased billions in costs that CARB dismissively tells contractors to pass on to the customer/taxpayer. (VCE1) (PCCA)

Agency Response: We acknowledge that some fleets will pass on costs to customers; however, these costs are not expected to be significant. As discussed in the Technical Support Document on page 185, even if fleets passed on all the costs of compliance to their customers, they would need to raise their revenue by only 0.1 percent to 3.0 percent. For a discussion of passing on costs, see also the responses in section 3)e)vi) of this chapter of this FSOR. If fleets are

able to pass on costs, it is possible that there may be a small increase in the cost of construction. For a discussion of infrastructure cost increases, see the responses in section 3)f)iii) of this chapter of this FSOR.

In adopting the regulation, the Board judged that the public health benefits that the regulation will achieve justified the small increase in the cost of construction. As stated in Chapter XI of the Technical Support Document, the regulation will result in direct and indirect costs on the economy and consumers. Accounting for indirect costs, the regulation is expected to reduce California economic output by about \$700 million and personal income by about \$2.3 billion from their projected levels in 2010. In the context of the State's economy, the economic impact of the regulation is minor and is not expected to impose a noticeable impact.

For a discussion of housing cost increases due to the regulation, see the responses in section 3)d)xi) in this chapter of this FSOR.

In section 3)f)vii) in this chapter of this FSOR, commenter STODDARD stated that the regulation will increase the waste removal costs in California. For a further discussion of this issue, please see the response in section 3)f)vii) of this Chapter of this FSOR.

For a discussion of the regulation's impact on employment, see the responses in section 3)g) in this chapter of this FSOR.

3)f)iii) Increased Infrastructure Costs

- 1. Comment:** The demands to meet such hasty deadlines would not only put financial strain on the construction industry but substantially increase the cost of rebuilding efforts throughout CA. (HUFF)
- 2. Comment:** An unintended consequence of this regulation is to cause a huge escalation in the cost of public works construction. (SHAWM1)
- 3. Comment:** The prices for any work done in the state will have to go up at least two-fold, maybe higher. (CBC)
- 4. Comment:** The proposed regulations will cause the cost of construction to double. (TURVEY)
- 5. Comment:** This regulation will make the cost of the work rise and further pressure the budget of the agencies. (CDTOA1)
- 6. Comment:** Are we trying to make new home, building, highway, infrastructure, remodeling, construction, landscaping, beach & parks, tree trimming etc the most expensive in the nation? (PB)

- 7. Comment:** With this severe regulation, operation costs will be significantly higher, which means that bids will have to be higher, which means that the state will have to pay higher prices to complete work, including schools, hospitals, etc. Even with higher bids, the cost of compliance with this regulation cannot be absorbed immediately. It will take many years to recover from the fiscal impact, if at all. (MSSE)
- 8. Comment:** CARB is currently considering the adoption of off road diesel regulations that would have a negative impact on our company as well as California's infrastructure rebuilding efforts. (AGCA1) (ARTBA1) (ARTBA2) (DUVALL) (EDWARD) (FCICI2) (MALDONADO2) (MARGETT) (MCCULLOUGH) (MILLER) (MLD) (PBL) (SR) (VC&M)
- 9. Comment:** I foresee a significant slowing in the construction industry. (J&M)
- 10. Comment:** Who do you think will build the infrastructure that is needed for commerce in this state after you succeed in strangling the construction industry? You are completely out of touch with reality when it comes to the costs and practicality involved in this regulation. (GWE)
- 11. Comment:** CARB is irresponsible if it makes the off road diesel regulation without a true understanding of the impact to the cost of private and public works construction. (SHAWM1)
- 12. Comment:** Prices for our work will have to rise sharply to cover this projected capital expense. Our customers, cities in Southern California, will have to delay and reduce the amount of capital improvements because they will not be able to afford the prices we will have to charge. (WPC1)
- 13. Comment:** Infrastructure rehabilitation will be severely retarded. (WPC2)
- 14. Comment:** This regulation comes at an especially bad time what with the state planning to go on a highway building spree. (SLOCBE)
- 15. Comment:** The regulation will reduce the number of pending public works projects. Additionally, costs incurred by contractors in meeting these requirements will be passed on to their clients, raising the price of bids to public agencies and increasing the costs of all public and private infrastructure projects in California. (EUCA1)
- 16. Comment:** Construction equipment price hikes caused by the regulation, as well as the resulting consolidation of the construction industry, would serve to raise the overall costs of public infrastructure projects, thereby lowering the amount of these goods that can be purchased. That is, the

regulation would directly result in fewer highways and schools being built, less affordable housing being constructed, and fewer repairs to the state's levee system. (CIAQC1)

- 17. Comment:** If the regulation is implemented as presently drafted, it would have a profound, NEGATIVE impact on California's infrastructure rebuilding efforts. (PBL)
- 18. Comment:** It is our opinion that the proposed rules will have a profound negative impact on the construction industry's ability to execute the State's work. (RJB2)
- 19. Comment:** Another result of this proposed ruling is that projects are going to become much more costly. Our State is in dire need of much work. This regulation is going to make it much more difficult to do this work and at a much higher cost. Many projects simply will not get done and infrastructure will just get worse. The cost of not being able to improve our State infrastructure may be the highest cost of all. (HBE)
- 20. Comment:** The regulation will mean more expensive roads, highways, bridges, schools, houses etc. The public coffers will not stretch nearly as far as they do today, and that will mean higher taxes to pay for the added costs. It will become a vicious circle with no end. (TERRELL1)
- 21. Comment:** The industry does not have the infrastructure to support the regulation. It will freeze the states' ability to build, maintain and repair roads, provide emergency disaster relief, and help the commercial and public work force create the housing and industrial building necessary to provide this state with the infrastructure they need to bring in business. (WKC)
- 22. Comment:** If implemented, the regulation would have a profoundly negative impact on our ability to stay in business. We're a small family-owned underground construction firm specializing in public works infrastructure rehabilitation. Infrastructure rehabilitation will be severely retarded. We'll have to charge more money for our work. (WPC3)
- 23. Comment:** The regulation will produce immeasurable delays and costs to critical infrastructure and housing development projects. Now is not the time for the adoption of burdensome new regulations that will only serve to further slow the housing market, put a drag on the economy and disappoint California taxpayers who are anxious to see the infrastructure funding they approved last fall go to work in their communities today. (EDWARD) (GAINES)

24. Comment: Fewer contractors and higher construction costs mean fewer roads, schools, housing developments and levees. (PPC)

25. Comment: Without a new proposal, Californians risk seeing new ineffective regulations that prevent us from building the roads, schools, housing and flood protection systems our state so desperately needs. (BECC)

26. Comment: I want to let the Board know that these regulations are not right for infrastructure rebuilding efforts. (DD)

27. Comment: The effect of these measures will be to reduce affordable housing; reduce the amount of purchasing power for state and local governments for infrastructure improvement, the reaping of huge profits by Halliburton type companies with the resources to plunder California's private and public coffers. (JOHNSON)

28. Comment: As a client of the construction industry, the City will face increased costs to implement public works projects, possibly affecting the schedule and overall cost-effectiveness of these construction projects. (LACITY)

Agency Response: We do not believe that the costs of the off-road regulation raise the costs of construction significantly or prevent or delay infrastructure developments in California. The cost of the regulation, while significant, is small compared to the annual amount spent on construction in the State each year. As described in Chapter XI of the Technical Support Document, even in the year of maximum cost, the regulation is expected to cost \$568 million which is less than one percent of total annual construction valuation (~\$60 billion). In most years, the cost is projected to be much less than this.

In addition, many new infrastructure and transportation bond measures were passed in November 2007, and are expected to stimulate infrastructure growth and improvement statewide. As stated in response in section 3)f)iv) in this chapter of this FSOR, the costs of the off-road regulation are expected to reduce this bond money by less than one percent; this minimal impact is not expected to reduce the amount of construction funded by these bond measures.

Also, one stakeholder group solicited an independent review of the regulation, which included a discussion on a fleet's bonding capabilities. The review was conducted by Dr. Neil Eldin, Ph.D., Professional Engineer and is entitled "An Examination of the Construction Industry Compliance Costs for CARB's Off-Road Diesel Vehicle Rule." The review was submitted into the rulemaking docket for the in-use off-road diesel vehicle regulation during the May Board hearing, and is available on ARB's website as comment 21 presented during the Board hearing

at www.arb.ca.gov/lispub/comm/bccommlog.php?listname=ordiesl07. Please see Dr. Eldin's review for a list of his professional experience and qualifications.

In Dr. Eldin's review, he states that as a general rule-of-thumb, the cost of heavy duty construction equipment is about 25 percent of the total cost of construction projects. Even a 50 percent increase in equipment cost would translate to only a 12.5 percent increase in typical project cost. Thus, the increased equipment costs imposed by the regulation are not expected to increase the overall costs of construction by a significant amount. Although it is expected that most of the compliance costs of the regulation will be passed through to customers, these costs are not expected to significantly raise the cost of construction. For a more detailed discussion on passing on costs, please see the response in section 3)e)vi) in this chapter of this FSOR. For information on the compliance costs of the regulation, please see the response in section 3)d)i) in this chapter of this FSOR.

Commenter JOHNSON expressed concern that Halliburton type companies would plunder California's coffers. We assume by "Halliburton type" that the commenter means large out-of-state firms. The regulation applies equally to out-of-state firms as in-state, so we do not believe it gives such firms an advantage. If anything, the regulation is more strict for out-of-state firms because if they enter the state for the first time after the regulation is in effect, they must meet the fleet average requirements and do not have the option of meeting the BACT requirements.

Commenters CIAQC1 and PPC expressed concern that the regulation would reduce the number of contractors. Please see the responses in section 3)a)iv) in this chapter of this FSOR for discussion of why ARB staff does not believe the regulation will significantly reduce the capacity of the construction industry.

3)f)iii)1) Shrinking Fleet Project Delays

- 1. Comment:** Any shrinkage in the industry will result in delays in thousands of public projects, all of which reduce emissions from congestion relief. Those added emissions dwarf the construction emissions from those improvements. Those impacts have not been included in CARB's analysis of the economic and environmental impacts of the regulation. (CIAQC7)
- 2. Comment:** I fear that the regulation would compel many construction contractors to retire equipment long before the end of its useful life, costing workers their jobs and delaying the completion of essential infrastructure improvements. (CEI2)

Agency Response: Please see the responses in section 3)a)iv) in this chapter of this FSOR for discussion of why ARB staff do not believe the regulation will significantly reduce the capacity of the construction industry. See the response

immediately before this one for a discussion of why ARB staff do not believe the regulation will delay public construction projects.

For a discussion on job losses due to the regulation, see the responses in section 3)g) of this chapter of this FSOR.

Please see also the response in section 6)k)ii) of Chapter III-A-6 of this FSOR for a discussion of how the regulation reduces the useful life of equipment and why this is necessary.

Please see ARB's response in section III-B regarding conjecture about delays causing adverse environmental impacts being speculative.

3)f)iii)2) Slowed Infrastructure Projects

- 1. Comment:** This regulation is unreasonable because construction equipment is needed to build the infrastructure and buildings that will reduce car emissions, utilize renewable energy and conserve resources and will result in even dirtier air. (PCCA)
- 2. Comment:** Creating regulations which are so costly that it restricts a company's ability to perform will delay many of the infrastructure construction projects so desperately needed in this state. Who will build the roads and bridges? Traffic congestion not only creates timely delays which impact person's lives, it also impacts the air quality from the effects of long term engine idling currently experienced on most California roadways. (CUSACK)
- 3. Comment:** If this regulation proceeds as it is written, we sincerely believe it will undermine California's ability to make critical infrastructure improvements and will fail to deliver promised air quality benefits. (GC2)

Agency Response: We disagree. For the reasons discussed above in the first response in section 3)f)iii), we do not believe the regulation will delay infrastructure projects. Therefore, we do not expect it will delay or impact projects intended to reduce traffic congestion or have other environmental benefits.

As discussed in Chapter IX of the Technical Support Document, staff estimates that with implementation of the regulation, diesel PM emissions will be reduced by about 4.6 tons per day (tpd) in 2015 and 5.2 tpd in 2020 relative to baseline levels. These reductions represent a 60 percent decrease in PM emissions in 2015 and a 74 percent decrease in 2020. Although traffic congestion also contributes to air pollution, the reductions from the off-road mobile source category are necessary to meet the required state commitments under the Statewide Implementation Plan in 2014.

Please see ARB's response in section III-B regarding conjecture about delays causing adverse environmental impacts being speculative.

3)f)iv) Infrastructure Bond Money

- 1. Comment:** If we assume that most of the \$13.5 billion in added costs are concentrated in the heavy and public construction subsectors, and we assume further that the construction authorized by this bond will be completed in the same 2009-2020 time frame, then this added spending will represent 17% of the affected construction in that time period. As a result, the regulation would represent an added cost of about \$2.1 billion, thus reducing the effective spending for the bonds by 5%. The regulatory costs are likely to increase costs for the projects constructed through the bond measures authorized November 2006 by about \$2.1 billion. This represents 5% of the authorized bond amounts. (CIAQC1)
- 2. Comment:** The regulatory costs associated with compliance are likely to increase costs of the voter-approved infrastructure bond projects by about \$2.1 billion. This represents 5 percent of the authorized bond amounts. This means fewer roads, schools, housing and levees will be built and the pace at which these projects can be completed will be significantly slowed. (MARGETT)
- 3. Comment:** The CTC is in the process of approving nearly \$8 billion in transportation projects approved by the voters last November and \$12 billion more is in the pipeline. However, I am concerned that if these off-road diesel vehicle regulations are adopted as drafted, they would increase construction costs and reduce competition among companies bidding on projects. Both CARB and the industry have acknowledged that these regulations will increase the cost of construction. A recently released economic analysis indicates that these regulations are likely to increase costs for the projects constructed through the bond measures approved by the voters in November 2006 by about \$2.1 billion. That amount is 5 percent of the authorized bond amounts! (CTC)
- 4. Comment:** These regulations will cause construction contractors to either downsize or go out of business entirely – which means higher construction costs for projects and less construction jobs. It is estimated that these regulations will reduce infrastructure investment by \$2.1 billion at a time when our state needs every dollar it can get toward rebuilding infrastructure systems. (FISHERL)
- 5. Comment:** The rule in its current form will cause a 5 percent decrease in the buying power of the infrastructure bonds. (DUVALL)
- 6. Comment:** The successful passage of Proposition 1B will generate close to \$19.7 billion to fund transportation and air quality projects throughout

the state. The first 4.5 billion was recently allocated by the California Transportation Commission in the form of a list of 71 transportation projects aimed at relieving congestion and improving safety on our state highway system. One criterion these projects had to meet in order to receive project funding was near-term deliverability. But because the off-road diesel regulation targets the construction industry, if passed it will directly place these projects in jeopardy on their ability to stay on time and on budget. A coalition analysis demonstrated that regulations would increase costs for infrastructure bond projects by 5 percent. So here's some new cost examples to statewide transportation projects if the currently proposed regulation is passed: In Los Angeles, an additional 47 million will be needed to complete the construction of the Route 405 carpool lanes; in San Diego, an additional 22 million to build the new managed lanes on Interstate 15; in the Bay Area, close to 21 million more to construct a fourth bore at the Caldecott Tunnel; and in the Sacramento region, more than 16 million in new money to build the Lincoln Bypass. The big picture price tag has the potential to increase overall costs for the infrastructure bonds by 2.1 billion. (QUAN)

7. **Comment:** Construction equipment price hikes caused by the regulation, as well as the resulting consolidation of the construction industry, would serve to raise the overall costs of public infrastructure projects, thereby lowering the amount of these goods that can be purchased. That is, the regulation would directly result in fewer highways and schools being built, less affordable housing being constructed, and fewer repairs to the state's levee system. If the bond spending is spread over the 2009-2020 period, construction spending will increase about 4%. The estimated added regulatory costs over that period are \$9.7 billion. Assuming the bonds incur an equal proportion of these costs, \$400 million of the bonds will be spent on compliance costs, reducing the effective spending for the bonds by 1%. (AGCA3) (CIAQC6)
8. **Comment:** The regulation will negatively impact the \$40 billion REBUILD CALIFORNIA bond program. In addition to driving up contractors costs and bid prices, the reduction in the number of bidders / will drive up project costs. Fewer contractors will also mean reduced capacity to perform the work and a delay in the issuance of contracts. The Bond dollars will fund fewer projects than originally planned. (CIAQC7)
9. **Comment:** Our economic analysis concludes that the state-wide fleet could shrink by as much as 30,000 pieces of equipment. A reduced fleet will limit the size and type of contracts that companies can bid on and will reduce the bonding capacity of those firms to do additional work. The regulation will have a dramatic effect on the cost of construction contracts just as California launches the \$40 billion rebuilding bond issue effort approved by the voters in November 2006. (CIAQC8)

- 10. Comment:** These rules will also significantly reduce the buying power of the historic \$43 billion infrastructure bonds the people of California approved last November. Due to the enormous expense of replacing this equipment – in some cases more than \$1 million for each machine – the cost of construction projects will likely increase. This means fewer roads, schools, housing and levees will be built and the pace at which these projects can be completed will be significantly slowed. (ARTBA1) (ARTBA2) (FCICI2) (MALDONADO2) (MCCULLOUGH) (MCQUEEN1) (MCQUEEN2) (MILLER) (PPC) (SCOTTR) (SR) (VC&M)
- 11. Comment:** The rule would increase the time required to make critical improvements to the state's infrastructure, including the improvements that the people of California approved last November 2006, when they approved \$43 billion in infrastructure bonds. The construction industry would need more time to perform such a great volume of work, and congestion and other problems would therefore linger. In addition, as time passed, and the cost of labor, material and other inputs continued to increase, the number and scope of the improvements that such bonds could finance would gradually but steadily decline. In the end, there would be fewer and smaller improvements to roads, schools, levees and the like. (AGCA3)
- 12. Comment:** The priority purpose of Proposition 1B was to improve air quality through relief of traffic congestion, funding of transit, and measures to reduce emissions from goods movement activity. This regulation will come into play probably in exactly the wrong time in terms of when the Proposition 1B moneys are being ramped up, when equipment is needed, when contractors are needed. There seems to be a pretty uniform consensus within the transportation community that adequate technology and equipment resources for retrofit are not likely to be there within the next two years. If that happens and equipment is pulled out and contractors are forced to pull back from projects, there are a lot of projects that will benefit air quality that will be undermined and delayed. (JEFFE)
- 13. Comment:** Now is not the time for the adoption of burdensome new regulations that will only serve to further slow the housing market, put a drag on the economy and disappoint California taxpayers who are anxious to see the infrastructure funding they approved last fall go to work in their communities today. CARB is running the risk of creating overnight a huge shortage of equipment needed to build a variety of infrastructure, including projects funded under last years infrastructure financing package as contained in prop 1B-1E. (GAINES) (EDWARD)
- 14. Comment:** Proposition 1B through 1E calls for significantly improving our infrastructure but the mandated acquisition of the required equipment may

cause taxpayers delays and cost overruns in the hundreds of millions of dollars. Is there a fiscal analysis given the passage of those ballot measures? (ASA)

15. Comment: The voters of California recently approved the spending of billions of dollars over the next few years to repair California's badly decayed infrastructure. Who is going to do that work if CARB drives the cost of those projects up or drives the contractors out of business? (EUCA)

16. Comment: The program will put contractors out of business (or at least severely reduce their ability to perform) during a time when Governor Schwarzenegger's Go-California Team is promoting the ICE (Industry Capacity Expansion) Program to handle the large upcoming amount of highway work. (DCCI)

17. Comment: The off-road diesel regulations will have a profound, negative impact on our company, on many of our employees and on the Governor's laudable infrastructure bond projects. (TCS)

18. Comment: To meet CARB's objectives in such a short time-frame will cause an enormous impact to the state's economy and the multi-billion dollar bond initiatives passed last November. It will also drive many contractors out of business entirely. (CRS) (MAY) (NNC)

19. Comment: Are we trying to minimize the payoff of recent voter passed construction bonds making the cost of "Rebuilding California" out of site? Is this mandate really what California's voters want? (PB)

20. Comment: How are we going to attack these new state infrastructure bonds, and how are we going to go after that work when we can't use our equipment? (COAT)

21. Comment: California has worked too hard to shore up and fund much needed bond measures to rebuild California. Passage of this regulation will contravene the will of the voters. Instead of building roads, parks, schools, and hospitals, contractors will be forced to replace the cornerstone of their business; their equipment. (JJAI)

22. Comment: As drafted, the regulations would have devastating impacts on construction, mining, and other affected industries and government agencies. The cost of converting equipment to meet the regulation, the lack of available technology, and the aggressive schedule for implementation would likely have severe and unmanageable economic impacts. These regulations would only compound the massive infrastructure issues the state is currently facing and delay vital public

works projects funded by the infrastructure bonds passed by the voters last November. (OCBC)

23. Comment: Because of this rule, we will see an absolute decline in the fleet numbers. This decline will cost the state dearly in lost competition for the bond projects and all other critical work. (SCCA3)

Agency Response: We do not believe that costs of the off-road regulation will have a significant effect on infrastructure bonds. If the regulation costs are accurately estimated and properly allotted to the portion of the construction industry that performs public infrastructure work, ARB staff estimates that less than one percent of the value of the infrastructure bonds would be affected by the regulation. This small less than one percent effect will most likely not slow or decrease infrastructure projects funded through the infrastructure bonds.

A number of commenters above (including CIAQC1, MARGETT, CTC, FISHERL, DUVALL, and QUAN) cite a concern that the regulation would reduce the effective value of the infrastructure bond money by five percent, or by about \$2 billion (out of \$40 billion). The commenters are repeating a finding released by the consultant M Cubed as part of an analysis M Cubed performed for the stakeholder group, the Construction Industry Air Quality Coalition (CIAQC). We believe the M Cubed finding is inaccurate, as described further below. While it is unclear how M Cubed reached its finding, as the documentation for its analysis was not provided in its report, we believe M Cubed assumed that the full cost of the regulation (using its estimated cost of the regulation of \$13.5 billion) was concentrated exclusively in the public construction sector. However, data from the Department of Finance shows that of total statewide construction value, more than 60 percent of which is in the residential (not public) sector. If such is the case, it was inappropriate M Cubed to assume that the cost of the regulation would only affect construction in the public sector which represents less than half of the statewide construction value. Additionally, as presented in Chapter V of the TSD, construction represents only half of the industries affected by the regulation; other industries such as the mining and airline industries make up the remaining 50 percent. The infrastructure bonds will not affect many industries outside of public construction, and ARB believes that is not correct to assume that the regulation costs of non-construction industry vehicles will affect the infrastructure bond money. In addition, staff believes the \$13.5 billion regulation cost calculated by M Cubed is incorrect, and that their cost is based on assumptions used to artificially inflate the costs of compliance; ARB staff estimates the cost of the off-road regulation to be \$3.0 billion to \$3.4 billion. A more detailed discussion of why we believe the M Cubed cost analysis greatly overstates regulation costs is located in section 3)c) in this chapter of this FSOR. As stated, if the regulation costs are properly allotted to just that portion of the construction industry that performs public infrastructure work, ARB estimates that less than one percent of the value of the infrastructure bonds would be affected

by the regulation. This small less than one percent effect will most likely not slow or decrease infrastructure projects funded through the infrastructure bonds.

A more detailed discussion on the effects of the regulation on infrastructure costs is located in section 3)f)iii) in this chapter of this FSOR.

Commenter JEFFE raised a concern regarding retrofit availability. For a discussion of retrofit availability, please see the responses in section 2(a) of Chapter III-A-2 of this FSOR.

Commenter DCCI raised a concern that the regulation would put contractors out of business. Please see the responses in section 3)a) of this chapter of this FSOR for a discussion of why we believe the regulation will be affordable.

Commenter COAT raised a concern that the regulation would prevent them from using its equipment. The regulation does not ban the use of any vehicles. Instead, it forces fleets to gradually retrofit and accelerate turnover to higher tier vehicles.

Commenter OCBC raised a concern regarding lack of available technology. As discussed further in the responses in Chapter III-A-2 of this FSOR, we believe adequate technology will be available to meet the regulation's requirements.

Commenter SCCA3 raised a concern regarding an absolute decline in fleet numbers. We do not believe the regulation will cause reduced capacity in the construction industry in California, as discussed further in the response in section 3)a)iv in this chapter of this FSOR.

3)f)v) Rental Rate Increases

- Comment:** By increasing the industry demand for occasional capacity, the regulation would increase demand for rental equipment. Increased demand for rental equipment will put upward pressures on rental prices. In addition, the proposed regulation imposes higher costs on rental fleets themselves, particularly larger rental fleets that must comply with stricter accelerated emission standards. The proposed regulation's increased costs on rental fleets also will put upward pressure on rental prices. These two factors (increased industry demand and increased supplier costs) combined would act to greatly increase rental prices. Since smaller construction firms tend to rely more on renting vehicles than larger ones, this will effectively increase small fleet costs even though the regulation is supposedly designed to mitigate small fleet impacts. (CIAQC6) (AGCA3) (CIAQC1)

Agency Response: We acknowledge that there may be an increase in demand for rental vehicles in response to the regulation, since using rental vehicles in lieu of owning, older high-polluting vehicles is a viable compliance option for many

fleets. We also acknowledge that some rental businesses may increase their rates due to the regulation. However, because they normally turn over their vehicles so rapidly, we believe many rental fleets will be able to comply with the regulation without incurring substantial costs that must be passed through to their customers.

Many rental fleets have a high turnover rate, and therefore, their fleets are comprised of younger vehicles. For example, the American Rental Association submitted information to ARB staff during development of the regulation that indicated their member fleets are on average about four years old. As stated in Chapter XI of the TSD, compliance costs for a fleet increase as the average age of the fleet increases; for the youngest fleets (of any size) that are 8 years old or newer, the regulatory costs are estimated to be between \$0/hp to \$50/hp. Fleets that are on average four years old are likely to face only reporting and recordkeeping costs due to the regulation. Because they normally turn over their vehicles so fast, we estimate that many rental fleets will have little to no compliance costs associated with the regulation.

However, there will be some older rental fleets that will experience higher costs. For these older fleets, we expect that some of their compliance costs will be passed on to their customers, and an increase in rental costs would occur. Some of these older rental fleets are likely businesses that in the past chose a business strategy of maintaining older vehicles and renting them at rates lower than those for new vehicles. To reduce their emissions, such businesses will need to move toward owning newer vehicles and are likely to need to raise their rental rates closer to those of businesses that rent new vehicles.

Because we expect variability in the rental fleet market in terms of compliance costs and the extent to which those costs will be passed through, it is difficult to assess what the impact to small construction firms that rent vehicles will be. However, despite the fact that we think some small construction firms may face higher rental rates, we do not expect this cost to be catastrophic for them

For a detailed discussion of the impacts on small businesses, see the response in section 3)a)ii) of this chapter of this FSOR.

3)f)vi) Fuel Efficiency Decreases

- 1. Comment:** Like the NOx retrofit program for automobiles in the 1970s, this regulation will affect fuel efficiency. The cost associated with increased fuel consumption due to the retrofits required by the regulation is not clearly identified. (RONSIN1) (RONSIN2)

Agency Response: The regulation does not require the installation or use of NOx retrofit devices (their use is allowed in lieu of turnover, and staff believes that their use may be considered by fleets in as much as they would save a fleet money). However, as described in Chapter 11 of the TSD, some retrofits, and

especially those that achieve PM emission reductions, do result in up to a two percent fuel penalty. In developing the TSD, staff carefully considered these impacts (including the impacts of NOx plus PM devices) in its economic and green house gas impact analysis. In addition, the fuel penalties associated with Tier 4 vehicles are discussed in Chapter 9 of the TSD.

3)f)vii) Waste Collection Increases

- 1. Comment:** The regulation involves highly variable compliance costs over a 10-year period. Therefore, hundreds of contract amendments would be required during each of the next 10 years as the industry incurs compliance costs. Each of these contract amendments would in turn require adjustments to the solid waste collection rates set by local governments and paid by millions of California households and commercial businesses. Waste Management estimates they will face a total cost for compliance with the regulation from 2009-2020 of \$93,877,825. (STODDARD)

Staff Response: We do expect that the waste collection industry will pass through most of their costs incurred by the regulation. Staff believes, however, that Waste Management has significantly overestimated the costs for compliance with the regulation. As discussed in the response to comment 3)d)i)1) in this chapter of this FSOR, and using the same methodology as discussed in the Technical Support Document, staff believes that Waste Management's costs attributable to this regulation will total approximately \$6 million from 2009 to 2020, not \$94 million. This would correspond to a ratepayer increase of \$0.36 per household per year (this compares to \$0.85 per household to pay for the Solid Waste Collection Regulation). Staff also believes it is important to note that this estimated rate increase per household per year does not take into consideration the substantial number of commercial accounts that Waste Management services, which could bear a significant portion of this cost. It also does not take into consideration that the actual costs to California ratepayers could be less if some of the compliance costs could be covered come from Waste Management revenues and environmental fees collected outside the state.

3)f)viii) Decreased Competition

- 1. Comment:** This regulation will greatly increase the cost paid by California taxpayers and property owners on construction projects as the larger contractors who remain in business will have to submit increasingly higher bids on projects to cover the enormous expenditures they will incur to "repower" their massive fleets. (TURNER)
- 2. Comment:** The negative impact on your decision will cause companies to leave CA and force major construction into a smaller pool of mega contractors who will be able to raise their prices and cost ALL CALIFORNIANS more money to build. (WEISS)

3. **Comment:** It will reduce the number of competitive bidders on public contracts, increasing the cost of public improvements. (GHILOTTIBC)
4. **Comment:** We have seen what the lack of competition has done to the price of gasoline. Supply and demand will be a loss. And the same changes will happen to the construction industry, to the cost of housing, to our schools and our infrastructure, a price that the working men and women of this state cannot afford. (OE4)
5. **Comment:** State entities such as CalTrans will be able to complete only 56 percent of the work it thinks it is going to complete in their present budget. Surety credit will tighten and there will be fewer contractors who can bid on public work, probably raising bid numbers even higher. (FAUCHIER)
6. **Comment:** Infrastructure project prices will increase dramatically due to fewer bidders. Many out of state construction firms will simply decide to either not bid in California. Local firms will close their doors forever. This will reduce the number of competitive bids submitted; further increasing bid prices for all public and private clients. (EUCA1)
7. **Comment:** This will narrow the scope of contractors with the ability to bid work and thus drive up overall costs and not just in the private sector. (MCDONALD)

Agency Response: As discussed in the response in section 3)a)vi) in this chapter of this FSOR, staff acknowledges that the number of fleets may decrease due to the regulation. However, this decrease is not expected to be significant, and we do not believe the regulation will cause a lack of competitive bids. As discussed in the responses in section 3)a) in this chapter of this FSOR, we expect the regulation to be affordable for the vast majority of fleets, and that fleets will pass along a portion of the regulatory compliance costs, which could result in a rise in the cost of construction by a small percentage. Although some construction cost increases may occur throughout the state because of the regulation, we believe the number of competitive bids will not be reduced, and therefore costs are not expected to increase further due to a lack of competition amongst contractors.

For a more detailed discussion on increases in infrastructure costs, see the response in section 3)f)iii) in this chapter of this FSOR. For a discussion of surety credit and bonding, see the responses in sections 3)e)iv ad 3)e)v) in this chapter of this FSOR.

3)g) Job Losses

1. **Comment:** The regulation will cause job losses. (ABBS1) (BECC) (GHILOTTIBC) (HBE) (J&M) (JJAI) (MARGETT) (MCCARTY) (SHAWM1)
2. **Comment:** The regulation will cause employees to hit the unemployment lines and their families would no longer have company health benefits. (COADA) (SIEVERT1)
3. **Comment:** This cannot be done without laying off employees and could even result in our company leaving the state or going out of business entirely – which means the loss of many high-wage jobs. (SCOTTR)
4. **Comment:** The ARB has not taken into consideration the employees that will lose their jobs. (RRPI2)
5. **Comment:** I am convinced that many of these jobs will be lost. This includes the jobs of many of my family members and friends, as well as possibly my own. Why do I think this proposed legislation will cause many Californians to lose their jobs? Because the financial burden on small contractors will be too great. It takes many, many years for the owners of a small grading or demolition contracting firm to amass the capital to buy several loaders, excavators, and scrapers. This type of construction is a classic example of a low-margin line of business. If the proposed legislation is adopted and enforced, and this equipment has to be “repowered” at a very high cost then the owners of such a business will likely choose to sell their equipment one piece at a time. Selling equipment or closing shop altogether will be a more financially viable option than “repowering” older smaller fleets. This equipment will basically no longer be welcome in California, which means that the jobs of all the equipment operators, dispatchers, mechanics, truck drivers, parts salesman, and affiliated trades will also no longer be welcome in California. This will have the effect of leaving only the largest contractors in the California marketplace, shutting down an untold number of family businesses. (TURNER)
6. **Comment:** I guess the only good thing is that there will be less competition. The young guys won't be able to get started and the older guys will simply quit. I can see a lot of unemployed operators with this bill. (CBC)
7. **Comment:** Why is it ok to put people out of work? (RRPI1)
8. **Comment:** Are we interested in putting businesses as well as employees out of work? (PB)

- 9. Comment:** The regulation will result in devastation or closure of many contractors, many of whom are minorities. This in turn will result in dramatic increases in unemployment. (ECA)
- 10. Comment:** The general rise in the price of construction will mean less construction. With less construction, some good paying jobs with great benefits are going to be lost. (AE)
- 11. Comment:** This is an industry that's dominated by hardworking, family-owned companies that have passed that on from generation to generation. They employ nearly one million people in the State of California. And make no mistake, this regulation will eliminate thousands of those companies and tens of thousands of those employees. (CBCC3)
- 12. Comment:** I fear that the proposal would compel many construction contractors to retire equipment long before the end of its useful life, costing workers their jobs and delaying the completion of essential infrastructure improvements. (CEI2)
- 13. Comment:** Their monthly bottom line to pay their workers and buy materials will drop which will impact the timeliness and quality of their work, and mean loss of jobs. (ASA)
- 14. Comment:** We will be forced to cut crew and staff by fifty percent in order to handle the new cost of the regulation, as well as the rising cost of insurance and fuel that will impact us all at one time. (VPC)
- 15. Comment:** I am not opposed to doing my part to clean the air. The time frame of this ordinance will cause me to cut my business and employees back because I don't have the equipment to support them. (STOWE2)
- 16. Comment:** The effects of this regulation as currently written will be catastrophic to my business at a time when increased competition from private sector companies moving into public works has already caused me to downsize space and employees. The regulation as written will severely hurt many construction businesses when we are already struggling to keep our companies moving forward and our employees employed. (LTE)

Agency Response: We acknowledge that there are likely to be job losses attributable to the regulation and we estimated the job loss in section J of Chapter VII the Staff Report and section G of Chapter XI Technical Support Document. However, as described in the Staff Report and Technical Support Document and described further below, we do not expect the job losses to be catastrophic.

When estimating the potential employment impact of the proposed regulation, ARB staff apportioned the annual costs among each industry affected by the regulation (i.e., the construction industry, the mining industry, etc.), of which construction represents about 50 percent, and then input these annual costs through an economic model of the California economy developed at the University of California, Berkeley called E-DRAM. This methodology takes into account both the creation and loss of jobs through various sectors of the California economy, and has been consistently used by ARB staff to estimate employment impacts for previous ARB rulemakings. As stated in the Chapter XI of Technical Support Document, as well as Chapter VII the Staff Report, this analysis estimated the potential employment impact of the proposed regulation at 1,000 jobs (0.01 percent) lost over the entire California economy in the year with the highest annual costs. However, based on industry's testimony at the May Board hearing that our estimates of the statewide employment impacts of the proposed regulation were too low, staff recalculated the job loss estimates. Staff found that with a more careful calibration of the model used to estimate job loss, known as E-DRAM, that our estimates of job losses should be higher, and could be as high as 3,400 in the worst year. This higher estimate occurs if costs accrue to those portions of the industry where employment is most sensitive to regulation costs. However, on average, we estimate that the statewide employment impacts of the proposed regulation are about 1,400 per year, still a factor of 10 less than the industry consultant estimates.

Additionally, as described in Chapter XI of the Technical Support Document, the construction labor force typically experiences employment fluctuations ranging from a six percent increase to three percent decrease from year to year. The loss in jobs due to the regulation, even in the worst year, is expected to be less than 0.5 percent of the construction industry employment total (3,400 vs. approximately 840,000), which is well within the normal fluctuations of employment in the that industry.

For a more detailed discussion on the timing or stringency of the regulation, see section 6(c)ii) in Chapter III-A-6 of this FSOR.

3)g)i) Downsizing Fleets

- 1. Comment:** With the proposed timetable of the rule, it puts an extreme burden on us in the first few years of the implementation, to the point that we'll have to drastically cut back the fleet size in order to meet the requirements. That involves cutting back the fleet and laying off valued employees. (MCCLAUGHLIN)
- 2. Comment:** The highest-level job losses will come through the retirement option exercised by contractors where machines are not replaced due to the high cost of new equipment. Contractors will hunker down, shrink their fleets and fight to survive. For each piece of equipment retired there is a

one to one ratio of operators fired with other company and vendor support personnel losing their jobs as well. (SCCA3)

3. **Comment:** This regulation can and will stop growth of our company since the lower our total fleet horsepower, the less money is spent to upgrade. We will actually experience incentive to down size our fleet, our company, and our work force. We will be losing jobs rather than creating them as we have in the past. (FCICI2)
4. **Comment:** As employees of Coastal Earthmovers, Inc., we strongly feel that if the regulations, as they are currently written, are passed, that all of our jobs will be in jeopardy. At the very least, contractor fleets will be cut down and many construction workers, along with field support staff will lose their jobs. This will cause a snow-ball effect that will cost California millions of dollars. (CEI3)
5. **Comment:** If we survive the regulation, downsizing is inevitable. Several of our crew and office staff will be unemployed. (WPC3) (WPC2)
6. **Comment:** Most likely we are going to cut back. There'll be layoffs. There are many people in my company that are very dependant on the stability of our company, along with their families. They all own homes. It's going to affect their livelihood as well. I hope before you people finally make a final decision and pass this requirement, you come up with some mechanism that will protect the companies and keep us in business and prevent layoffs. (AYALA)
7. **Comment:** I have one last request for you, and that's that we have jobs for these individuals when their training is done. Everyone is talking about the cost of equipment, the cost to the owners, and the cost to the manufacturers. I want to talk about the cost to the employees and their families. Every time this regulation speaks of reduction of equipment, early retirement of equipment, downsizing of numbers of piece of equipment, it should read downsizing of workforce and loss of jobs. Every piece of equipment has a chair and that has an operator. For every three pieces of equipment, there's a laborer on the ground, there's a surveyor. For every eight, there's somebody oiling and fueling that. For every 12, there's a mechanic. And this goes on and on. The loss of employment in the construction industry is going to be huge because of this regulation. The changes that have been made here do not address that. The cost, the real cost of this regulation, is going to be borne by the working men and women of the construction industry who lose their jobs, who can't make their house payments, and can't put food on the tables for their family. And that is a cost, not in dollars, but in the health of that family. We cannot trade the health of the environment for them. They cannot be the sole bearers of the cost of this regulation. (OE5)

- 8. Comment:** The cost of (compliance) would be \$1.2 million per year in our case. And this is running it through the staff's calculator. In 2006 our combined equipment purchases and our after-tax profit totaled \$258,202, well short of funding any of the previous scenarios. The only remaining option that I have for my company is to retire four or five machines to meet the rules and two or three employees per year until we can reach compliance. (MCCOY&SONS)
- 9. Comment:** This regulation will force me to either take on new debt trying to maintain compliance or to reduce my fleet size and work capacity, thereby reducing the number of employees I have. (AAI)
- 10. Comment:** We would need to down size our company to the number of pieces of equipment we could replace or repower and then only employ an equal number of operators for each piece of equipment. We currently have only about 30 employees, but if forced to meet the proposed CARB regulation we would have to reduce our work force to about 10 to 15 employees including office personnel. (BKE)
- 11. Comment:** We employ approximately 35 people and with this new regulation we would be forced to down size or close up. Many of these people who work for us have been employed with us for over 20 years, and the regulation could be devastating to them as well. (ANDREINI)
- 12. Comment:** [Replacing engines or equipment] may well necessitate drastic downsizing not only our fleet but also of our staff, our long-time employees who take care of them. (CARDE)
- 13. Comment:** If we choose to comply by reduction of our fleet size we will also reduce jobs. Because every piece of equipment that I have to retire, I'm going to retire an operator and probably two to three laborers that would follow that equipment around on a daily basis working. (AAWC2)

Agency Response: Although a fleet has the option of downsizing for compliance with the regulation, it is not expected that all fleets will take this route. There are lower cost options (other than vehicle replacement) for compliance with the regulation, which include repowering with a new engine, rebuilding the engine to a higher emission standard, and the possible installation of NOx VDECS if available. Also, even though a fleet may initially downsize to comply with the regulation, that fleet always has the option of renting vehicles to maintain employees; this would allow a fleet to use the low cost compliance option of retirement, while preventing job losses in their fleet. Additionally, by taking early actions to upgrade a fleet (such as installing VDECS or repowering vehicles), costs can be lessened in the early years of the regulation, and could possibly prevent fleet downsizing and employment loss.

It is also expected that fleets will be able to pass on some of the costs of compliance with the regulation. Passing on costs to customers can prevent excessive compliance costs and limit the amount of fleet downsizing and employment loss due to the regulation.

Even if some construction fleets do downsize to meet the regulation, we do not expect that the regulation will impact the overall amount of construction conducted in the state for the following reasons. First, construction is by its nature a local business that cannot be outsourced to other states or countries. Second, the cost of the regulation, while significant, is small compared to the annual amount spent on construction in the State each year. As described in Chapter XI of the Technical Support Document, even in the year of maximum cost, the regulation is expected to cost \$568 million which is less than 1 percent of total annual construction valuation (~\$60 billion). Thus, if one fleet downsizes and reduces capacity, another is likely to grow or enter the state to take its place.

See also the response above at the beginning of section 3)g) regarding the magnitude of total job loss expected due to the regulation and how the loss is expected to be well within the normal fluctuations in the construction industry.

3)g)ii) Increased Bidding Costs

- 1. Comment:** Higher bids will likely result in the cancellation of many planned construction projects, which will result in even more jobs being lost. (Turner)

Agency Response: It is not expected that higher costs will prevent construction projects in California. As discussed in the response in section 3)g)i) above, we expect that the regulation will not impact the overall amount of construction conducted in the state. Also, there are currently millions of dollars in construction bonds that will help provide work to many contractors affected by the regulation. See also the response above at the beginning of section 3)g) regarding the magnitude of total job loss expected due to the regulation and how the loss is expected to be well within the normal fluctuations in the construction industry.

3)g)iii) Underestimated Job Losses

- 1. Comment:** The projected statewide employment loss is 10,900 to 34,000 jobs using a set of reasonable and conservative assumptions about compliance cost estimates. This represents 1.3% to 4.1% of the state's construction employment. The ARB Staff has reported that it projects compliance costs to range from \$3.0 to \$3.4 billion annually. This can be translated into expected job losses based on the industry's job multiplier of 21.5 jobs per million in revenue. Based on the ARB Staff's estimates, the projected statewide employment loss is 2,500 to 5,500 jobs. Using a range from the higher cost estimates based on reasonable and conservative

adjustments to the ARB Staff's assumptions, the losses range from 10,900 to 34,000 jobs. This is equivalent to 1.3% to 4.1% of the state's construction employment. (CIAQC1)

2. **Comment:** As contractors are forced to shrink their fleets to comply with the regulation, between 10,000 and 30,000 jobs will be lost. CARB did not include the social and economic cost of those job losses in their health benefits or compliance cost calculation for the regulation. (CIAQC7)
3. **Comment:** The projected statewide employment loss is 4,300 to 29,400 jobs using a set of reasonable and conservative assumptions about compliance cost estimates. This represents 0.5% to 3.5% of the state's construction employment. The ARB Staff has reported that it projects compliance costs to range from \$3.0 to \$3.4 billion annually. This can be translated into expected job losses based on the industry's job multiplier of 21.5 jobs per million in revenue. Based on the ARB Staff's estimates, the projected statewide employment loss is 2,500 to 5,500 jobs. The Staff also reported a preliminary economic impact of \$700 million. Based on the BEA job multipliers, which are standard parameters used through the nation, this would translate to 15,050 jobs lost. Using a range from the higher cost estimates based on reasonable and conservative adjustments to the ARB Staff's assumptions, the losses range from 4,300 to 29,400 jobs. This is equivalent to 0.5% to 3.5% of the state's construction employment. Of particular note is that these costs will be borne largely by the narrower sector that relies on heavy equipment, which is perhaps 30% of statewide construction activity. (AGCA3) (CIAQC6)
4. **Comment:** Directing this much funding away from new construction projects could result in the elimination of over 40,000 construction jobs in California. These are good paying, full benefit jobs that contribute to our economy and ensure the healthy sustainability of California families and future generations. (QUAN)
5. **Comment:** We estimate that there will be a loss of over 30,000 jobs and over one and a half billion, dollars in payroll annually from the proposal as it stands now from the staff. (OE4)
6. **Comment:** Staff estimates 1,000 job losses because of this option, a ridiculously low number—suggesting that less than a tenth of one percent of equipment will be “retired.” Industry’s most conservative estimate is between 30,000 and 40,000 jobs lost. (SCCA3)
7. **Comment:** The regulation in its current form will have a projected statewide employment loss that could be as high as 34,000 jobs. (DUVALL)

- 8. Comment:** Projected statewide industry loss is estimated to be 10,900 to 34,000 jobs. This represents 1.3 percent to 4.1 percent of the state's construction employment. (MARGETT)
- 9. Comment:** Staff's published estimate of less than a thousand jobs per year loss is unrealistically low. (OE2)
- 10. Comment:** The job impacts should be about 7,000 rather than 1400. (CIAQC10)
- 11. Comment:** The staff's original report estimated that there would be a thousand jobs lost on average with a \$2.3 billion in lost wages. That is not factored into their evaluation. Now they say 1400 jobs average, 3400 jobs at a maximum with using their same numbers, a range of 3.2 to \$7.8 billion. (CEC2)
- 12. Comment:** ARB has understated the number of jobs that California would be likely to lose. If a contractor could not absorb the annual cost of replacing 8 percent of its fleet, and retrofitting another 20 percent, the contractor would have no alternative to downsizing its fleet. For the many reasons already given, most of the small, medium and other thinly capitalized contractors that dominate the construction industry would have to shrink, and the statewide loss of employment (in just the construction industry) would be somewhere between 4,300 and 29,400 jobs. (AGCA3)

Agency Response: The M Cubed economic analysis (performed on behalf of the stakeholder group, the Construction Industry Air Quality Coalition, or CIAQC) utilized a very simplistic approach that simply estimated that 21.5 jobs would be lost per million dollars of construction revenue lost. This approach does not take into account the new industries and jobs created due to the regulation, and does not account for employees shifting positions or changing jobs (e.g., a mechanic that worked on repowers who changes jobs in the company to now install VDECS). In addition, M Cubed assumed that the entire cost of the regulation would be allotted to the construction industry alone, when in reality construction represents only 50 percent of the industries affected by the regulation. With these assumptions, M Cubed estimated a significantly higher impact on jobs than was estimated by the ARB economic analysis. Also, as stated in the response for section 3(g) in this chapter of this FSOR, employment fluctuations in the construction industry have ranged from a six percent increase to three percent decrease in employment in the past couple years. Finally, although staff believes the unemployment estimates provided by M Cubed are artificially high, they are in the same range as normal employment fluctuations the construction industry faces each year.

See also the response above at the beginning of section 3(g) regarding how staff estimated the magnitude of job loss expected due to the regulation.

3)g)iv) Other Market Job Losses

- 1. Comment:** Virtually no compliant equipment will enter the used market in the future as fleet owners chase the emission reduction curve. This will destroy the hundreds of used equipment companies and auction companies throughout the state, putting their workers on the bench. Since the final goal of the regulation is a near match for Tier 4 engine standards most fleet operators plan to do as little as possible to their existing equipment until the new, cleaner engines are available. Some equipment dealers are reporting sales declines upwards of 40 percent—and are making staffing adjustments accordingly. (SCCA3)

Agency Response: As stated in the response in section 3)f)i) in this chapter of this FSOR, it is unlikely that the demand for new vehicles will increase; however, the demand for used vehicles may increase to meet the compliance needs older fleets. Additionally, as presented by staff at the May 25, 2007, Board meeting, a fleet does not need all Tier 4 and Tier 4 Interim vehicles to comply with the final requirements of the regulation; a fleet can comply on the final compliance date with a mix of Tier 2, Tier 3, and Tier 4 vehicles. Therefore, staff believes that there will still be a large market for used vehicles, and in fact the regulation may increase the demand for some types of used vehicles. The used vehicle market will also benefit because the regulation should result in fleet owners selling older vehicles out of the state and country. In total, we do not believe the regulation will cause a loss in sales for used equipment dealers and in fact the regulation may benefit them.

The current sales decline noted by the commenter is most likely due to the current downturn in the construction industry.

3)g)v) VDECS Jobs

- 1. Comment:** The staff says that these jobs could be replaced by sending these construction workers to manufacturing industries that build these filters. That is an insult to the craftsmanship of our membership that we do not appreciate. Secondly, these filters are already being built overseas. Why would they start a manufacturing process here in California? (OE4)

Agency Response: Although there will be job openings in the newly developing off-road VDECS market, staff acknowledges that not all jobs lost will be replaced with these new employment opportunities. Although some VDECS manufacturers started overseas, companies such as HUSS are realizing the potential for market growth in California, and are opening manufacturing and distribution centers in the United States (including California). Additionally, as stated in section 3)g)iii) above in this chapter of this FSOR, staff expects that some jobs will be shifted within the affected industries and will not necessarily be lost.

3)g)vi) Job Loss Effects on Economy

- Comment:** Creating regulatory hardships on businesses that ultimately cost the loss of jobs will have an immediate effect in several ways. The loss of income tax revenue attributed to construction wages alone will have a substantial impact on the state's overall economy not to mention unemployment costs. (CUSACK)

Agency Response: As stated in the first response in section 3)g) above in this chapter of this FSOR, it is expected that the job losses attributed to this regulation will be less than normal employment fluctuations experienced by the affected industries. Therefore, the job losses are not expected to have a large impact on the economy in the form of lost tax revenue or unemployment costs.

3)g)vii) Job Loss Indirect Effects

- Comment:** We're very concerned about the loss of jobs, and the lack of analysis of the indirect cost effects of this, the lack of analysis of the potential loss of other environmental solutions which can't be implemented because we're raising the cost of housing. (BIA-SD2)

Agency Response: Chapter VII of the Staff Report considers the total direct and indirect impacts of the regulation on the economy of the State, including the impacts from job losses and lost personal income. For a more detailed discussion of indirect impacts, see Chapter XI of the Technical Support Document. For a more detailed discussion on the effects of housing increases, see the response in section 3)d)xi) in this chapter of this FSOR.

3)g)viii) Tier 0 Job Losses

- Comment:** During the auction process they would announce when internet buyers bought tractors and what county or state they were heading to. Most of the tier 0 equipment went to Texas and Mexico. So bottom line is they are out of California. Let's not forget what is leaving with them - jobs and revenue. (CAMARILLO5)

Agency Response: Although most Tier 0 vehicles are expected to leave the state, staff does not believe many jobs will be leaving the state with those vehicles. As shown in Chapter VI of the Technical Support Document, the statewide fleet is expected to increase. As noted above in the response in section 3)g)i), because the regulation's cost is small compared to the total amount spent on construction each year, and because construction is by nature a local industry that cannot be shipped out of the state or country, we do not expect the regulation to significantly impact the amount of construction performed. If Tier 0 vehicles leave the state, they are likely to be replaced by newer, cleaner vehicles.

3)g)ix) Decreased Wages and Benefits

- 1. Comment:** This regulation will cost employees that are well paid and well taken care of. Employee wages and benefits will decrease. (FCICI1)

Agency Response: As stated in response 3)e)vi) in this chapter of this FSOR, many fleets are expected to pass on at least some of the compliance costs for the regulation. If the regulatory costs are passed on to customers, it is not expected that the revenues for these companies will be greatly affected. Therefore, most employees are expected to maintain their current income and benefits without experiencing pay or benefit cuts due to the regulation.

3)h) Return on equity (ROE) Analysis

- 1. Comment:** The return on equity (ROE) analysis found that between 60 and 80 percent of fleets would be expected to be able to absorb the cost of the regulation without incurring more than a 10 percent change in ROE. NWSC would like to point out that if additional revenue is not generated from the capital invested, the company will not experience a ROE on this investment. Looking at the aforementioned rig company, this company cannot absorb \$15,540,400 in compliance costs and not change the ROE and profitability of the company. (NWS)

Agency Response: We acknowledge that ARB staff's ROE analysis concluded that between 60 and 80 percent of fleets could absorb the cost of the regulation without incurring more than a 10 percent change in ROE, as described on pages 183 through 185 in Chapter XI of the Technical Support Document. This means that 20 to 40 percent of the fleets will incur more than a 10 percent change in ROE. NWSC is likely within the 20 to 40 percent of fleets that face such an impact. As shown in Table XI-16 of the TSD, costs for sample fleets analyzed by staff ranged from 6 to 132 percent of annual profits. On page 185 of the TSD, we acknowledged that if a fleet cannot pass on the regulation's compliance costs, in some cases, the costs of the regulation could potentially exceed its profits.

3)i) Periodically Update Economic Analysis

- 1. Comment:** ARB should expand and continue to refine its economic assessment with a focus on public agencies and small-to mid-sized businesses that must meet medium/large fleet requirements. Given that some of the measures and equipment needed to comply with this proposed regulation are in limited supply or not yet commercially available (i.e., limited CARB-verified retrofit diesel emission controls for off-road equipment to reduce PM, and Tier 4 off-road engines to reduce nitrogen oxides NOx), we urge ARB staff to continue to update information on cost and equipment availability and make that information available to all regulated entities. (LACITY)

Agency Response: As part of Resolution 07-19, the Board directed staff to periodically update them on the status of the implementation of the regulation. These updates will include discussions of technological availability, enforcement activities, and compliance issues. To support this effort, we will continue to monitor fleet compliance costs as well as the availability of technology and equipment as implementation of the regulation progresses.

For a more detailed discussion of Board updates, see the response to comment 16(d) in Chapter III-A-16 of this FSOR.

For a discussion of retrofit availability and Tier 4 engine availability, see the responses to comments 2a)i) and 2c)i), respectively, in Chapter III-A-2 of this FSOR.

3)j) Staff Report Economic Impacts

1. **Comment:** Missing from the staff report is a detailed evaluation of the economic impact on the construction industry, and in particular smaller family owned contracting companies that represent 90 percent of the total. According to our numbers, the regulation will cost the California construction industry an additional \$13 billion to comply. (CIAQC2)

Staff Response: Chapter 11 of the Technical Support Document (TSD) for the Staff Report contains a detailed economic analysis for the regulation, including impacts on small businesses.

For a discussion of the discrepancy between the \$3 and \$13 billion cost estimates, see the response in section 3)c) in this chapter of this FSOR.

3)k) Low-Use Vehicles

1. **Comment:** I may have a specialized tractor that only gets used once or twice a month (and not at all in the winter). To buy a new one could be \$80-\$100 thousand dollars for a machine that earns maybe one thousand per month is bad business and leads to bankruptcy. (WORTMAN)
2. **Comment:** Equipment working seasonally such as ours frequently does not get enough hours in 10 years to need to be replaced. The components simply are not worn out. (HBE)
3. **Comment:** Some of my older machines are perfect for leaving on a job where their use is minimal. Need that backhoe to move stuff around now and then and it doesn't cost much to use, it's paid for. A new machine, you couldn't afford to just leave it sit there. (CBC)
4. **Comment:** The proposed regulation discriminates against the medium-sized contractors and against the older and established businesses

because such businesses have acquired a lot of assets and equipment that we still use. But if we're only using it 200 to 400 hours a year, we can't afford to replace it with new equipment. (DCCI) (DCCI2)

5. **Comment:** Hydraulic rough terrain cranes average about 600 to 800 hours of operation every year. They're often idle for days or weeks at a time. They also are not able to drive themselves from job site to job site. That, combined with the strict policy of our founder that his fleet be kept in pristine condition, means the useful life of these cranes is very long. For a small company like ours, to replace these cranes with newer while they are still comparatively young or if we can possibly shoehorn a replacement engine in there to make it comply, it would have a staggering financial impact. (CARDE)

Agency Response: Under the regulation, if a vehicle is used less than 100 hrs per year (or in the past three years has operated on average, less than a 100 hrs per year), the vehicle is designated as a low-use vehicle. Low-use vehicles must be reported and labeled, but they are otherwise exempt from all performance requirements in sections 2449.1, 2449.2, and 2449.3. Therefore, vehicles that fall into this low-use category never need to be upgraded or replaced. The rationale for setting the low-use threshold at 100 hours per year (and not higher) is provided in the response in section 6)b)i in Chapter III-A-6 of this FSOR.

If a vehicle does not meet the low-use requirements, a fleet has many other options that do not require replacement with a new vehicle. First, the regulation never requires a new vehicle to be purchased for compliance with the NOx portion of the regulation. A fleet may purchase a newer used vehicle, repower their vehicle with a cleaner engine, retire the vehicle, or designate that vehicle as low-use and never operate it more than 100 hours per year in the future (as described below). Also, the specialty vehicle provisions in the regulation provide that if there is no used vehicle and no repower solution available, the vehicle is exempt from the turnover requirements. Additionally, a fleet may choose to comply with the NOx fleet averages (instead of BACT), and replace other more cost-effective vehicles before their lower use vehicles. Finally, if VDECS that achieve reductions in NOx become available, they may provide a lower cost option (that would count towards the NOx BACT turnover requirements) for vehicles with low utilization.

Another option for a fleet with lower use vehicles is to utilize the provisions in section 2449(d)(2) which allow a fleet to use its annual hours of operation for each vehicle in its fleet average calculations. For lower use vehicles that are older (and have higher emissions), this option would allow those vehicles to impact the fleet average less than they would normally. Thus, these provisions may allow fleets to do less turnover than would otherwise be required to meet the NOx fleet average targets.

If a fleet owner decides they will not need their lower use vehicles for much longer, PM VDECS can be installed on those vehicles which would give them a “guaranteed life” of six years before needing to be replaced. This would allow a fleet owner to utilize those vehicles for up to six additional years, or until they are no longer needed, without being required to replace them.

Lastly, if a fleet owner is forced to turnover the vehicle due to the NOx requirements of the regulation, they may meet their turnover obligation without necessarily replacing the vehicle. A fleet owner could cut back on the hours of use of that vehicle, and designate it as low-use; this designation would count as turnover towards the NOx requirements. Also, the fleet owner could decide to retire the vehicle, and rent a replacement vehicle when needed. The retirement of the vehicle would count towards the NOx requirements, and if a vehicle is rented, that vehicle does not count towards a fleet’s total horsepower, or affect their fleet averages. Additionally, renting vehicles may cut down on a fleet’s maintenance expenditures and be more cost-effective than buying a replacement vehicle.

The regulation also has special provisions to make it easier for small and medium fleets to comply. For example, if a fleet is designated as a small fleet, they are exempt from the NOx performance requirements in section 2449.1, and are not required to ever upgrade or replace vehicles (whether they are low-use or not). These provisions are discussed at further length the response in section 6)b)iv) in Chapter III-A-6 of this FSOR. See also the further discussions on affordability in the response in section 3)a) in this chapter of this FSOR.

4. Inventory and Survey

4)a) Inventory Inaccurate

- Comment:** We contend that last year's Ultra-Low Sulfur Diesel (ULSD) implementation was not calculated in ARB's future projections in regards to PM 2.5 emissions. ARB should substantiate claims by their Chief Deputy Executive Officer on May 25, 2007, at ARB's hearing at the Marriott Del Mar, which stated "Oh yes, we certainly included ULSD in our extrapolations..." (SCB)

Agency Response: To generate the emissions inventory estimates included in the Staff Report and Technical Support Document, staff used the ARB's off-road inventory model (OFFROAD model). To account for the implementation of ULSD fuel in California beginning in 2007, the OFFROAD model utilizes a fuel-correction factor for each pollutant. Therefore, the claim made by ARB's Chief Deputy Executive Officer at the May 25, 2007, Board Hearing was factually accurate.

2. Comment: Like the automotive industry, the diesel industry has long been striving to increase the life expectancy of their Products. In the last 20 years, the average life expectancy has doubled for diesel fired equipment.... This allows the engine to be rebuilt an infinite amount of times over the life of the entire machine and further increases the longevity of the equipment overall. Engines built in the mid 90's have a life expectancy of 10,000 – 15,000 hours. The life expectancy of stationary and portable engines is even longer as most of them run at a constant RPM under a constant load. Now the math; Tier 0 built in 1996 at an average of 1000 hours per year equates to 10,000 hours in 2006 or 15,000 hours in 2011 and even longer for stationary and portable engines. Stationary and portable engines can be and have been rebuilt numerous times and can reach life cycles of 20,000 to 40,000 hrs. (MCDONALD)

Agency Response: As discussed in Chapter III of the Staff Report and in the Technical Support Document, Appendix E, Section B.2.e) Useful Life, when developing the emissions inventory that was used to support the rulemaking, staff updated the model assumptions for useful life to more accurately reflect the age of vehicles presently in use today. The updated useful life has a maximum value of 38 years, such that the longest a vehicle would ever be modeled to live would be equal to twice that value or 76 years. In addition, the model takes into account the rebuild cycle for each engine, which is reflected as a cap in the deterioration rate after 12,000 hours. Staff believes these useful life assumptions are representative of the best available information to date and provides a reasonable estimate of the emissions from mobile in-use off-road diesel vehicles greater than 25 hp. (The emissions and populations estimates presented are for vehicles greater than 25 horsepower, since the proposed in-use off-road diesel vehicle regulation would only cover vehicles 25 horsepower and greater. Vehicles at exactly 25 horsepower are not included in the inventory estimate; however, staff estimates that such vehicles represent a negligibly small portion of the total inventory.)

3. Comment: The ARB staff analysis is highly sensitive to changes in assumptions about things -- about items and various parameters that are not documented or empirically based. Staff and consultants should not be presenting one number. We should be presenting a range of numbers that represent the uncertainty about the analysis that everybody has in this particular project: the uncertainty about the cost; the uncertainty about the population of vehicle; the characteristics of the vehicles; the type of technologies that will be available. All of those things should be incorporated in a range of uncertainty. Staff should present uncertainties to aid in Board members' decision-making. (M3CON)

Agency Response: Staff recognizes that there is uncertainty in all of the estimates presented in the Staff Report and Technical Support Document. However, staff believes that the emissions inventory estimates, including

estimates of vehicle population and characteristics, presented in Chapter VI of the Technical Support Document represent the best available information to date and provide a reasonable estimate of the emissions from mobile in-use off-road diesel vehicles greater than 25 hp. The OFFROAD model reflects updated values for population, annual activity, useful life, growth and emissions deterioration based on data obtained from five published sources, two surveys of off-road diesel vehicles in California, in addition to input from stakeholders and industry during the workshop and workgroup process that spanned for more than two years. In addition, prior to the Board Hearing, staff met with this commenter as well as statisticians from the University of San Francisco and presented specifics of the model as well as the methodologies used. For simplicity of presentation, in the Staff Report and Technical Support Document, we present the mean of the estimate, rather than showing error bars around every number. The justification for the estimates is discussed further in Appendix E to the TSD.

The cost of the regulation is addressed further in the responses in Chapter 3 of this FSOR.

4. **Comment:** Construction equipment is incidental to any effects on air quality in that it is only used in construction and not a vehicle used as primary transportation. Construction equipment air pollution is not even measurable against aircraft or the 8,000 cars put on our highways every month. The State cannot demonstrate that construction equipment has any impact upon air quality making it a target for needed regulation in the interest of public safety. (MLIC)
5. **Comment:** The amount of "pollution" released by equipment covered by the regulation is so small as to be almost negligible and will cost millions and millions of dollars to implement, all for very little gain. (ALLEN)

Agency Response: We disagree. The vehicles covered by the rule are a significant source of diesel PM emissions, as well as NOx emissions that lead to ozone and ambient PM, and construction/mining vehicles are the largest source of emissions from the vehicles covered by this regulation. Half of off-road vehicles today have no emission controls, and some can last up to 76 years. As a result, the vehicles covered by the regulation emit large amounts of soot or PM and NOx, which are toxic, currently causing about 1,100 premature deaths per year.

As described further in Chapter VI section D (Current Emission Estimates for In-use Off-road Diesel Vehicles) of the Technical Support Document and Chapter II of the Staff Report, off-road vehicles are responsible for nearly a quarter of the total PM emissions from mobile diesel sources and nearly a fifth of the total NOx emissions from mobile diesel sources, in California.

The regulation is projected to affect approximately 180,000 vehicles (year 2005 population), which currently emit about 386 tons per day (tpd) of NOx emissions and 23 tpd of PM emissions. Construction and mining equipment emit 332 tpd of NOx and 19.8 tpd of PM in 2005, making up the largest source category associated with the off-road regulation (86% of the NOx and 87% of the PM that will be addressed with this off-road regulation).

The cost of the regulation is addressed further in the responses in Chapter 3 of this FSOR.

6. **Comment:** ARB's modeling relies on unrepresentative data or unsupported assumptions. For example, the number and composition of mobile equipment in the off-road inventory is inaccurate. (CIAQC1) (CIAQC6) (AGCA3)
7. **Comment:** ARB should create a better inventory of the "categories, numbers, and relative contribution of present or anticipated sources of the substance, including mobile... sources," as the Tanner Act requires. (PILCONIS)(AGCA3)

Agency Response: Staff believes that the emissions inventory estimates, including estimates of vehicle population and characteristics, presented in the Staff Report and documented in Chapter VI and Appendix E to the Technical Support Document represent the best available information to date and provide a reasonable estimate of the emissions from mobile in-use off-road diesel vehicles greater than 25 hp. (The emissions and populations estimates presented are for vehicles greater than 25 horsepower, since proposed in-use off-road diesel vehicle regulation would cover only vehicles 25 horsepower and greater. Vehicles at exactly 25 horsepower are not included in the inventory estimates here, but staff estimates that such vehicles represent a negligibly small portion of the inventory.) The justification for the estimates is discussed further in Appendix E to the TSD.

8. **Comment:** The calculations of the staff are questionable. Companies with balanced fleets (equal numbers of tier 0, 1, 2 and 3 engines), do not operate those equipment the same amount of hours. Newer, more productive equipment, with large capital investment, need to work more hours, older equipment is often used as back up equipment (much like a second beater auto). In our company tier 2 and tier 3 equipment works on average 1,800 hours a year, tier 0 equipment on average works 500 hours. Thus "dirty" equipment has less emission than projected by staff. (ESCOBEDO)
9. **Agency Response:** Staff acknowledges that newer, cleaner vehicles are used more than older, dirtier ones and this was taken into account when developing the emissions inventory by the incorporation of 'activity by

age'. For example, the hours per year of operation of a particular Tier 3 vehicle will be higher as compared to that of a Tier 0 vehicle of the same equipment type. This trend of decreasing activity as a vehicle ages was one of the main inventory improvements incorporated during the rulemaking. The Technical Support Document, Appendix E, Section B2d. Activity describes this in further detail.

4)a)i) Granite Fleet

- 1. Comment:** CARB is working with an inaccurate statewide equipment inventory and false assumptions regarding the natural turnover rates of in-use construction equipment. Analysis of other fleets in the state validate our belief that Granite's fleet is cleaner than most. According to CARB; however, our fleet would be significantly dirtier than the average fleet. Two areas of concern surface with an inaccurate CARB off-road inventory: CARB's assumed current Tier mix of engines in the state is wrong and CARB's projected natural turnover rate of equipment is artificially inflated. (GC2)

Agency Response: We disagree and believe the emissions inventory and natural turnover assumptions used by staff are accurate. As discussed in Chapter III of the Staff Report and documented further in the Technical Support Document in Chapter VI and Appendix E, Section B2e (Useful Life), based on survey results, the model assumptions for useful life were updated to more accurately reflect the age of vehicles presently in use today. In fact, staff approximately doubled the expected useful life of most types of construction equipment. The new useful life has a maximum value of 38 years, such that the longest a vehicle would ever be in use would be equal to twice that value or 76 years. As shown in the pie charts in Figure VI-2 in the Technical Support Document, in 2005, 52% of the vehicles in the construction/mining industry were Tier 0 or model year 1999 or older. The rate of natural turnover or attrition utilized by the model is a function of the age of equipment and the proportion of equipment that has been removed from service. The attrition rate was developed by Power Systems Research and incorporates variations in maintenance practices, accidental failures, engine quality and performance. Staff believes that the updated useful life estimates and attrition rates are based on the best available information to date.

Staff acknowledges that Granite Construction has one of the newer, cleaner heavy construction fleets. Based on survey information provided by Granite Construction in April 2006, we know that Granite's fleet contains long-lived vehicles like scrapers, bulldozers, and cranes. When evaluating the representativeness and validity of the inventory estimates in the Staff Report and Technical Support Document, it is important to note that the regulation covers a diverse set of fleets, including fleets primarily made up of smaller, shorter lived equipment types such as skid steer loaders, and rental fleets that turn over their vehicles relatively quickly. Therefore, the fact that the Granite fleet is newer than

most heavy construction fleets is not inconsistent with the fact it is still older than the overall tier distribution averages presented in the Staff Report and Technical Support Document, and does not mean the Staff Report and Technical Support Document estimates are inaccurate.

4)b) Survey Inadequate

- 1. Comment:** We do not understand how it is possible to make determinations regarding average fleet mixes without performing an adequate inventory analysis and obtaining all the necessary information - engine model year and rated engine horsepower are required to identify the tier level of an engine. Neither of these pieces of data was collected in the CARB survey. In addition to failing to include relevant information, the CARB survey did not receive a sufficient number of survey responses to assure a representative sample. Moreover, self-administered surveys tend to skew the composition of the respondent sample. The statistical sample generated by the CARB Staff Survey is simply of insufficient size to build a regulation on. Regarding turnover, the necessary questions were not asked to establish the turnover practices of equipment owners in the state. The CARB survey and the data received from the survey are flawed and inadequate to support this regulation. (GC2)

Agency Response: We disagree with the commenter and believe ARB staff performed an adequate inventory analysis and obtained all the necessary information to provide a reasonable estimate of the emissions from mobile in-use off-road diesel vehicles greater than 25 hp. We believe the inventory estimates presented in Chapter VI of the Technical Support Document represent the best available information to date.

We acknowledge that ARB's 2005 off-road equipment survey did not ask for engine model year or rated engine horsepower for every engine, and that such data would be required to identify the tier level of each engine. To increase the number of fleets willing to take the time to complete the survey, ARB staff opted not to require survey participants to provide data on each and every engine in their fleet. Instead, the survey collected summary data by vehicle type. The survey was not intended to determine the total population or tier distribution of off-road vehicles in California. Instead, it was meant to provide data on fleet characteristics and operating practices (purchasing practices, operating hours, idling practices, etc.) that could be used to refine the inventory data we had from other sources. The other sources of data that informed our inventory estimates are discussed at further length below.

Although we acknowledge that a little over 5 percent of all affected fleets responded to ARB's 2005 off-road equipment survey, as noted by commenter SHAWM1, that survey was by no means the only source of information used to develop the inventory that underlies the emissions estimates in the Staff Report and Technical Support Document. The OFFROAD model (which was used to

prepare the emission inventory estimates in the Staff Report and Technical Support Document) reflects updated values for vehicle population, annual activity, useful life, growth and emissions deterioration based on data obtained from five published sources, and two surveys of off-road diesel vehicles in California, in addition to input from stakeholders and industry during the workshop and workgroup process.

We acknowledge that ARB's 2005 off-road equipment survey was self-administered. Staff opted to conduct the survey ourselves rather than hire a contractor to complete it in order to speed completion of the survey. However, we do not agree that having the survey conducted by ARB skewed the results. Additionally, as noted above, the inventory estimates used to support the board's decision in adopting the regulation were based on many sources other than ARB's 2005 off-road equipment survey - including two surveys of off-road diesel vehicles in California that were not self-administered.

The commenter claims that the necessary questions were not asked to establish the turnover practices of equipment owners in the state; we disagree. ARB's 2005 off-road equipment survey asked for average engine age when retired or sold. Because many survey respondents did not fill in this field, to gather further information on turnover practices, staff gathered additional fleet data from stakeholders during Spring of 2006 on average age of their vehicles by vehicle type. This data was used, together with information from the MacKay construction equipment universe study (2003), to update the useful lives for each equipment/vehicle type in the OFFROAD model. The useful lives determine the turnover rate assumed for each equipment/vehicle type.

2. **Comment:** The ARB has estimated the number and composition of mobile equipment in the off-road inventory from national surveys that do not reflect state-level compositions. (CIAQC1)

Agency Response: We disagree. As described in Chapter VI of the Technical support Document, the OFFROAD model was used to prepare the emission inventory estimates in the Staff Report and Technical Support Document. We updated the OFFROAD model to reflect the following sources of data:

MacKay & Company Construction Universe Study (MacKay, 2003) of nationwide construction equipment population and activity; TIAX Public Fleet Survey (TIAX, 2003) on off-road diesel equipment owned by public fleets in California; Yengst & Associates Equipment Analysis Reports (Yengst, 2003-2005) for various types of construction equipment nationwide; United States Environmental Protection Agency (U.S. EPA) NONROAD model (USEPA, 2004)/ Power Systems Research (PSR, 2000) for population of industrial equipment; Air Transport Association (ATA, 2004) data for ground support equipment (GSE) population;

ARB's Off-Road Diesel Equipment Survey (ARB, 2006a) of off-road diesel vehicles owned by both public and private entities; ARB's Off-Road Mini Survey (ARB, 2006b) on average age of construction equipment by equipment type; and Input from stakeholders and industry representatives during the workshop and workgroup process for the in-use off-road diesel vehicle regulation (2004-2006).

Although we acknowledge that some of these were national surveys, others provided data specific to California. The following sources provided California-specific data: TIAX Public Fleet Survey, Air Transport Association (ATA, 2004) data for ground support equipment ARB's Off-Road Diesel Equipment Survey ARB's Off-Road Mini Survey. We also vetted our inventory estimates with industry stakeholders with fleets in California during the workgroup and workshop process and incorporated their input as appropriate.

4)c) Underestimates Population of Vehicles

- 1. Comment:** CARB Staff does not have a good fleet census. According to CARB staff, the off-road diesel fleet in California is about 50% tier 0 engines. In workshops they explained that this analysis was derived using "national averages" that were tweaked with their state equipment census. Their statewide census was admittedly weak with, staff claims, a little over 5% of the industry responding to a request for census information. An industry census shows that the tier 0 engines comprise well over 60% of the fleet horsepower. How can CARB understand what the emissions generated by the fleet are and what the scope of the emissions solutions are without having an accurate fleet census? There is no question that an accurate census is the first necessary step to understanding the scope of this problem and the scope of the resolution of this problem. CARB staff does not have this census. (SHAWM1)
- 2. Comment:** The Coalition has tried numerous times to inform you that we have far underestimated California's fleet. You've been misguided by the 160,000 in the number. (SCCA5)
- 3. Comment:** Inventory underestimates vehicles: ARB has underestimated the amount of equipment that the proposed rule would affect. AGC has found, however, that national data (such as the Yengst reports) is not representative of the California market. (AGCA3)

Agency Response: Staff believes that the emissions inventory estimates, including estimates of vehicle population and useful life presented in Chapter VI of the Technical Support Document, represent the best available information to date and provide a reasonable estimate of the emissions from mobile in-use off-road diesel vehicles greater than 25 hp. Although we acknowledge that a little over 5 percent of all affected fleets responded to ARB's 2005 off-road equipment survey, as noted by commenter SHAWM1, that survey was by no means the only source of information used to develop the inventory that underlies the emissions

estimates in the Staff Report and Technical Support Document. The OFFROAD model (which was used to prepare the emission inventory estimates in the Staff Report and Technical Support Document) reflects updated values for vehicle population, annual activity, useful life, growth and emissions deterioration based on data obtained from five published sources, and two surveys of off-road diesel vehicles in California, in addition to input from stakeholders and industry during the workshop and workgroup process.

We recognize that there has never been a registration requirement for in-use off-road diesel vehicles and therefore the inventory numbers in the Staff Report and Technical Support Document are by necessity an estimate. However, we researched and purchased all available data on populations and ages of off-road vehicles and also updated the inventory to reflect data received from stakeholders during the workshop and workgroup process. During the workshop process for the regulation, a number of stakeholders made claims similar to those of SCCA5 and AGCA5 above that the ARB inventory was inaccurate. However, when asked for data, they were unable or unwilling to provide data that could be used to further update ARB staff's estimates.

Originally, the statewide population of vehicles was based on nationwide data that was attributed to California on the basis of the dollar value of construction. During the regulatory support effort, these vehicle population estimates were updated based on data from the MacKay & Company's Construction Equipment Universe Study (2003), ARB's off-road diesel equipment study (2005), the Power Systems Research Database (2000) and input from stakeholders and industry. Staff believes that the updated vehicle population estimates are representative of the best available information to date.

4)d) Base Year 2000 Inventory Data Not Presented

1. **Comment:** CARB established the goal of reducing PM by 85 percent from the 2000 baseline emissions. That number, and the inventory calculations to determine it, has not yet been documented by CARB. Also, it has made it impossible for contractors who know their 2000 emissions levels to match their baseline to the proposed annual emission average numbers.
(CIAQC7)

Agency Response: We disagree. The source of the 85 percent reduction goal cited by the commenter is the Diesel Risk Reduction Plan, which was adopted by the Board in 2000 and which was referenced in the Staff Report. The Diesel Risk Reduction Plan set forth a goal of reducing diesel PM emissions and their associated risk by 85 percent from year 2000 levels. The 85 percent reduction goal has already been documented by ARB in the Diesel Risk Reduction Plan, and further documentation is not needed as part of this rulemaking.

The intent of the regulation is not to reduce each and every individual fleet's emissions from their base year 2000 levels. Instead the regulation aims to

reduce diesel PM and NOx emissions to the maximum extent possible in a cost-effective manner, keeping in mind the economic impacts of the regulation. Thus, there is no need for each fleet to know their own year 2000 emission estimates, as requested by the commenter. However, to be responsive to stakeholder questions during the workshop process, staff provided year 2000 statewide emissions inventory estimates to stakeholders who asked for them, including this commenter. In addition, Table 1 in the Technical Support Document, Appendix E, contains the statewide base year 2000 and 2005 population by vehicle type of off-road equipment subject to this regulation. Also, the emission reduction needs and goals of the regulation are described further in Chapter II of the Staff Report.

We disagree that ARB has not documented our inventory calculations. ARB staff's inventory calculations developed in support of this rulemaking are described at great length in Chapter VI and Appendix E of the Technical Support Document.

4)e) Natural Turnover Overestimated

- 1. Comment:** The natural turnover rate has been underestimated. (CBCC3)
- 2. Comment:** The forced vehicle turnover rate of 8% under the rule (i.e. entire fleet replaced within 12.5 years) is much faster than the natural turnover rate, which is between 2% and 4% per year (i.e. entire fleet replaced within 25 to 50 years) (MCQUEEN1) (MCQUEEN2)
- 3. Comment:** The ARB models presume an annual normal retirement rate of 4.45% while the U.S. EPA uses 3% which is a value more consistent with industry experience. It is also not apparent how the ARB model accounts for the necessary introduction of new equipment to meet the higher standards. The current retirement and turnover rate of existing and future equipment affects the assumed expected remaining life of each equipment type; The ARB retirement rate does not differ by horsepower despite industry experience that large machines tend to last longer. (CIAQC1)
- 4. Comment:** The difference in the CARB estimated cost of compliance and the actual cost of compliance originates through the CARB assumed natural annual turnover rate (3.9%) and the actual turnover rate (1.0% to 0.0%) of an owner's fleet. (DER1)
- 5. Comment:** Staff should consider the natural turnover of 2 to 3 percent per year instead of the unrealistic 8 to 10 percent, and similarly the same thing with the after-treatment, so that these people in this room can meet this regulation within the scope of the contractors' reinvestment capital. (QC2)

6. **Comment:** The normal turnover rate for these large vehicles is even below the estimate of 3% per year provided by CIAQC, which is significantly below ARB's estimate, which we understand to be 4.5% per year. (MCQUEEN3)
7. **Comment:** Natural turnover is overrated. Normal turnover for off-road construction equipment is 2.5 to 3% annually. By using a higher number, CARB's model demonstrate a lower compliance cost by shifting regulatory costs to the normal turnover category. (CIAQC7)
8. **Comment:** CARB is working with an inaccurate statewide equipment inventory based on false assumptions regarding the natural turnover rates of in-use construction equipment. CARB's assumed current Tier mix of engines in the state is wrong and CARB's projected natural turnover rate of equipment is artificially inflated. ...many companies add equipment to their fleet but often do not rotate out the old equipment...It is our opinion that the traditional turnover rate of equipment in the State of California is much lower than CARB staff has projected. (GC2)
9. **Comment:** Our company, like many others in the Valley, was built one piece of equipment at a time. The company was started by my father-in-law and mother-in-law. And was run on credit cards to begin with. When we talk about equipment turnover rates, we still own and operate the very first excavator and the very first backhoe that were bought by our company. (AAWC2)
10. **Comment:** The ARB models presume an annual normal retirement rate of 6.7%, but this requires that new vehicle sales be 50% higher than historic data indicates. However, using new equipment sales data for 1998 to 2005 from the Engine Manufacturers Association and the growth in construction industry revenues for that period of 1.6% per annum, the fleet turnover rate is 3.7% or only just over half the rate assumed in the Staff analysis. On several key parameters, ARB's modeling relies on unrepresentative data or unsupported assumptions, for example, the current retirement and turnover rate of existing and future equipment, thus affecting the assumed expected remaining life of each equipment type. The underlying retirement rate in the Staff analysis is 6.2%. We acquired new equipment sales data in California for 1998 to 2006 from the Equipment Manufacturers Association. The average sales for this period was 8,215 pieces of equipment. However, to achieve both a 6.2% turnover rate and a 1.5% growth rate for that period would have required an increase in sales of 47% or about 3,860 new vehicles. It is obvious that the Staff assumptions are not consistent with actual sales data for the recent historic period. Using the state construction industry gross state product and the emission inventory we were able to estimate the actual annual sales growth and equipment retirement rates that match the total

equipment inventory used by the Staff. With a sales growth rate of 2.6%, which matches a 1.95% growth rate in the fleet size, the equipment turnover rate is 3.7% with total sales of 10,114 vehicles in 2010.(CIAQC6)(AGCA3)

11. Comment: We got sales data from the Engine Manufacturer's Association. There's about 8500 vehicles sold in California over the '98 to 2006 period. The turnover rate in the fleet that would match that amount of sales is 3.7 percent per year versus the staff has an assumption of 6.2 percent in their model. (CIAQC10)

Agency Response: We disagree. We believe that the updated useful life estimates and attrition rates in the OFFROAD model, which was used to generate the emissions inventory estimates in the Staff Report and Technical Support Document, are a reasonable estimate of the average normal turnover of off-road vehicles affected by the regulation and are representative of the best available information to date.

As discussed in Chapter VI and Appendix E, Section B.2.e) of the Technical Support Document, the model assumptions for useful life were updated to more accurately reflect the age of vehicles presently in use today. The new useful life has a maximum value of 38 years, such that the longest a vehicle would ever live would be equal to twice that value or 76 years. The rate of normal turnover (i.e. natural turnover or attrition) is a function of the age of equipment and the proportion of equipment that has been removed from service. In the OFFROAD model, approximately 4.7 percent of the vehicles in the construction/mining industry are assumed to turn over on their own normally each year (not 6.2 percent as claimed by commenters CIAQC6 and AGCA3).

Commenter CIAQC1 was incorrect in claiming U.S. EPA uses a 3 percent annual normal retirement rate. U.S. EPA has its own model, the NONROAD model. It uses a normal turnover rate of approximately 7 percent per year for the off-road vehicles affected by the in-use off-road diesel vehicle regulation, which is even faster normal turnover than modeled by ARB's OFFROAD model. ARB staff pointed this out to representatives of CIAQC and their consultant, M. Cubed, during meetings and in workshops in June 2007, and M. Cubed admitted they had misquoted U.S. EPA.

We recognize that some fleets, such as that described by commenter AAWC2, may keep vehicles longer than average and therefore may have longer useful lives than the average in the OFFROAD model. However, that does not mean that the model's representation of the total statewide fleet is inaccurate.

Commenters CIAQC6, CIAQC10, and AGCA3 cite sales data from the Engine and Equipment Manufacturers Associations. We would like to note examining sales data is inadequate to predict the normal turnover of vehicles. Sales data

indicates the number of new vehicles entering the fleet. It says nothing regarding the normal turnover (i.e., retirement) of vehicles as they leave service and are retired. Also, sales data represents only sales of new vehicles. It also says nothing about vehicles that may have been bought used or brought in from out of state by fleets that have operations in more states than California. Therefore, we believe that the sales data cited by CIAQC6, CIAQC10, and AGCA3 does not indicate the normal turnover in the OFFROAD model should be changed.

Finally, commenter CIAQC1 suggests that turnover should be slower for higher horsepower vehicles. The OFFROAD model does include slower turnover for some vehicle types, like scrapers and dozers, that tend to have high horsepower versus other vehicle types, like skid steer loaders that tend to have low horsepower. We acknowledge that the model does not incorporate higher turnover within a vehicle type for larger vehicles within that type. Staff did not have any data indicating that higher horsepower vehicles within a vehicle type live longer than lower horsepower vehicles. Thinking that this trend might exist, while working on updates to the OFFROAD model in support of the regulation, staff examined auction websites to see if high horsepower vehicles tended to be older than low horsepower vehicles. That was not the case. Therefore, we did not incorporate that trend in the OFFROAD model.

The cost of the regulation and the fact that ARB staff believes we have accurately estimated that cost is discussed further in the responses in Chapter III of this FSOR.

4)f) Comprehensive Survey Needed

- 1. Comment:** One of the main reasons that off-road NOx retrofit technology has lagged behind is there is no clear market for the technology, and there is insufficient data about the number and type of off-road engines where NOx retrofit technology is needed. To obtain this data, ARB needs to do a detailed inventory of off-road engines. After the inventory is completed, NOx control providers will have the data they need to invest in NOx control technology development. Without this data, cost-effective NOX controls will not be developed. The need for a comprehensive inventory of off-road vehicles, which accurately quantifies the distribution of vehicles between vehicle types as well as the total number of vehicles, is another reason that the NOx provisions should be delayed for at least 5 years.

(MCQUEEN1) (MCQUEEN2)

Agency Response: Staff shares the commenter's desire to see off-road NOx retrofit technology develop and become widely available. However, staff believes that the engine population and age distribution estimates presented in Chapter III of the Staff Report and documented further in Chapter VI of the Technical Support Document represent the best available information available and provide the most complete and accurate estimate of the population of mobile in-use off-road diesel vehicles greater than 25 horsepower operating in California.

Moving forward, we expect that after the first round of reporting for the in-use off-road diesel vehicle regulation is complete in the Spring of 2009, staff will have even better vehicle and engine inventory data available and can share this data with potential developers of NOx control technologies.

5. Complexity

5)a) Regulation Too Complex

1. **Comment:** The regulation is too complex. (BENTE) (ENDSLEY) (CALPASC1) (SUKUT3) (DER1) (POHLE) (CBIA) (TA) (TNT) (JANSSON) (BUCKANTZ) (CIAQC2) (GDB) (CSIA)
2. **Comment:** I'll have to hire an attorney and specialist to interpret the regulation. (CBC) (CIAQC7)
3. **Comment:** Unless a simple English version of the regulation can be prepared, non-compliance will be widespread. (CIAQC7)
4. **Comment:** Rule can be simplified without reducing the environmental benefits or unduly reducing compliance flexibility. (CATF1)
5. **Comment:** Setting up a strategy to comply with this complex regulation is not easy. (CAMARILLO4) (CAMARILLO7)
6. **Comment:** The regulation is the most complicated regulation of the diesel rules and it regulates the most complicated diesel engine categories. (CBIA)

Agency Response: As discussed in the May 25, 2007, Board Hearing, because the regulation would affect so many stakeholders in so many different industries and agencies, and because it affects such a diverse set of vehicles, the regulation was designed to provide maximum flexibility and is therefore by necessity somewhat complex. The complicated diesel engine categories necessitate a more complicated regulation if the regulation is to be applied fairly to the various fleets. As discussed in Chapter IV section L of the Staff Report, to simplify the regulation would require the removal of many of the elements that provide much of its flexibility, including the fleet average provisions. For the regulation to provide the flexibility it needs to address the many situations and special cases that may arise and remain enforceable, it must be somewhat complex. Situations that may arise, such as fleets that add vehicles, face manufacturer delays, move vehicles in and out of state, apply experimental retrofits, or operate specialty vehicles, must be adequately addressed. Thus, the regulation is by necessity rather long and complex.

Much of the complexity of the regulation stems from its fleet average provisions. The regulation could be simplified, for example, by requiring that all vehicles be retrofit by a certain date, or by requiring phase-out of all engines of a certain tier by a certain date. However, doing so, would sacrifice much of the flexibility that the regulation provides and would result in higher compliance costs for no commensurate emission benefit. Further, for some fleets that specialize in operations with long-lived vehicles, the increased economic burden could be difficult to absorb without severe losses in profitability.

The complexity of the regulation is largely the result of the request and the desire of the industry to have flexibility. And to put that flexibility in and to still have an enforceable regulation leads to complexity.

To help fleet owners understand the regulation, the ARB will conduct outreach workshops, training sessions, meetings with individual fleets, and provide written and electronic aides. Staff has already developed a set of six fact sheets in plain English that boil the regulation down into easier to understand language, and will continue to refine these materials as implementation proceeds.

Staff plans to develop and provide fleets with a set of electronic tools for reporting and for determining compliance planning and tracking. Also, fleets who wish to avoid the complexity of the fleet average altogether may instead choose to comply exclusively with the mandatory annual turnover and retrofit provisions. For example, fleets can plan to retrofit 20 percent of their horsepower per year and turn over 8 percent of their horsepower per year (through 2016). The ARB has already provided a fleet average calculator that allows fleets to experiment with various strategies for rule compliance and will provide an on-line compliance assistance tool that enable fleet owners to assess various strategies to comply with the rule. Staff envisions that the electronic reporting system would automatically determine the fleet average and targets for each fleet such that fleets would be aware of whether or not they meet the fleet targets before taking more action than required.

Staff also expects to commit significant resources for outreach and education about the regulation to assist fleets in meeting the requirements. The Heavy-Duty Diesel In-Use Strategies Branch has formed a new section with seven staff members whose sole purpose is to help fleets implement the regulation.

5)a)i) Uncertain and Changing Requirements

- 1. Comment:** The regulation requires a fleet owner to predict future facts to know what the law requires and plan accordingly. The proposed regulation is so complex, and its requirements so variable and unpredictable, that effective compliance planning becomes impossible. There is no way for any company to forecast a real and effective business plan based on what might happen in the years to come. (ATA1) (ATA3) (GDB) (ECCO6)

2. **Comment:** There are too many variables and too much uncertainty to effectively plan. I have to perform technology and cost assessments on every single piece of equipment, guess at the availability and costs of technologies in the future, guess at future economic conditions, while accounting for the interrelated nature of NOx and PM controls and the effect of exemptions, which again are pollutant and technology specific. A year or two into the future, it becomes hopelessly complex and uncertain. I could burn a huge amount of my time trying to make this work and wind up making mistakes resulting in noncompliance or looking at unexpected, substantial and fairly immediate cost burdens. (CBIA)
3. **Comment:** Inadequate allowances are made for changes beyond the control of the fleet owner. (ATA1) (ATA3) (GDB)

Agency Response: We recognize that the regulation is complicated and does present fleet owners with many choices. Indeed, this complexity is derived from the flexibility staff built into the regulation to ensure that fleets had sufficient compliance options. However, we do not agree that compliance planning is impossible.

For simplicity, fleets that do not want to comply with the more complex fleet average requirement can always elect to chart their compliance planning based on meeting the annual BACT requirements – 8-10 percent turnover of their horsepower, and retrofitting 20 percent of their horsepower. If a fleet meets the fleet average targets, it can do less than the BACT requirements. But the regulation never requires fleets to do more than the BACT requirements.

As stated in the response to section III-A-5)a), ARB will conduct outreach workshops, training sessions, meetings and compliance assistance with individual fleets, and provide a set of electronic tools for compliance planning. Staff has already provided an electronic fleet average calculator that many fleets have used to begin developing compliance plans.

A fleet owner can mitigate future compliance uncertainty by folding in a small margin of safety in their compliance planning for a given year. Whether the fleet owner chooses the fleet averaging provision or the BACT path to comply, any actions taken in a given year will accrue to the benefit of the fleet owner in later years. Under the fleet averaging provisions a fleet that is cleaner than necessary will have to do less in subsequent years. Under the BACT path the regulation includes carryover provisions that allow any excess turnover or retrofit be carried over to subsequent years.

Staff believes it is not likely that a fleet owner will comply with the regulation with absolutely no margin of safety in any given year. However, the size of the compliance safety margin determines the uncertainty, and ultimately a fleet

owner's risk, of not being in compliance with the requirements of the regulation. This balance between compliance safety margins and risk will necessarily be determined by the fleet owner.

The issue of whether targets should be based on horsepower is addressed in the response to section III-A-6c)ii)1) in Chapter III-A-6 of this FSOR.

5)a)ii) Allow Companies to Make Own Decision

1. **Comment:** ARB has had to add exemption and clarifications to the rule because the rule tries to control every aspect of the decision making process of individual fleets. (TA)

Agency Response: As discussed above in the response to in section III-A-5)a) in this chapter of the FSOR, in developing the rule, staff added significant flexibility at the request of industry, with the result being a rule that is more complex than one that is purely prescriptive. However, in providing this flexibility, it is necessary to ensure all aspects of the regulation provide a fair and level playing field for the diverse fleets subject to this rule. Staff disagrees with the commenter that the rule tries to control every aspect of the decision making process of individual fleets. The flexibility provided in the rule allows fleet owners more discretion in deciding how to comply with the rule; at the same time, with more discretion, more clarification is necessary to maintain an enforceable rule.

5)b) Regulation Not Clear

1. **Comment:** I read this rule ten or fifteen times, and even now I am not entirely certain of the rule requirements. I would strongly encourage CARB have a couple of highly experienced technical editors go through this and every regulation before it is released to the public. (CBIA)

Agency Response: We agree that the regulation is detailed, with numerous requirements and flexibility provisions. However, the off-road regulation meets the clarity standards as set forth in title 1, CCR, section 16, in that it is written in plain English and uses the ordinary meaning of words. The language set forth in the off-road regulation is similar to that used in previously adopted in-use Airborne Toxic Control Measures adopted by ARB. (See title 13, CCR, sections 2020, 2021 et seq., 2022 et seq., 2477, and 2479.)

Every effort has been made to make the regulation as clear and understandable as possible; however, because of the diversity of sources covered by the regulation and the multitude of special situations that may arise during regulatory implementation, the detail of the regulation was impossible to avoid. Staff plans to issue guidance and advisories as needed to clarify special issues that may arise during regulatory implementation, and to make resources available to affected stakeholders to assist in understanding the compliance requirements of the regulation.

6. Regulatory Provisions

6)a) Applicability

1. **Comment:** The regulation should apply the same to public agencies as to private industry. We would like to see city, county, state, and federal agencies take a leadership role in meeting compliance at the same time as the private industry. (SUKUT3)

Agency Response: Staff agrees. The regulation applies to public agencies just as it does to private industry. The regulation applies to any person, business, or government agency who owns or operates within California (except for agricultural, or personal use, or for use at ports or intermodal railyards), any diesel-fueled off-road compression ignition vehicle engine with maximum horsepower of 25 horsepower (hp) or greater. The fleets are divided into one of three categories: small, medium, or large, based on the total horsepower of the affected vehicles and the type of owner.

The regulation requires fleets to be retrofitted, and to accelerate turnover of fleets to newer, cleaner engines in order to meet the fleet average emission rate targets for PM. In addition, the large and medium fleets are required to meet the fleet average emission rate targets for NOx. The regulation takes effect for the largest fleet first with the compliance date of 2010, while the medium have a compliance date of 2013. The requirements are delayed until 2015 for small fleets. These fleets are subject to only the PM fleet average, and thus would not have to accelerate turnover their vehicles.

All state and federal government fleets are considered large, regardless of total horsepower, and therefore have to meet the requirements of the regulation, just like any privately owned large fleet. In a sense the rule is stricter for state and federal government fleets than for private fleets, because even a federal or state fleet with less than or equal to 2,500 hp must comply with the large fleet provisions, whereas a private fleet with a similar amount of horsepower may comply with the less strict small fleet provisions.

The only area where a public fleet may meet a less stringent requirement than a comparable private fleet is in a low population county. Under the regulation, municipalities in low-population counties (generally those with less than 125,000 people) are classified as small fleets, regardless of size, and therefore have more time to comply with the PM requirements and are not subject to the NOx requirements. Staff included the low-population county municipality provisions to maintain consistency with the public fleets rule (title 13, California Code of Regulations, §§ 20022-2022.1) and to recognize that municipalities do not have the same opportunities to pass on compliance costs to their customers as do private fleets.

6)a)i) Unfair to Impose Requirements on End Users

- 1. Comment:** It is unfair to impose requirements on people that bought the vehicles. Instead, ARB should just impose requirements on engine manufacturers and wait for them to trickle through the fleet. Existing fleets should be grandfathered in. It is not fair to impose requirements on equipment that is not at the end of its useful life. (TNT) (ECCO7) (POHLE) (CEI3) (CEI2) (RONSIN1) (PILCONIS) (AGCA3) (STOWE2) (DDGE) (EUCA) (PB) (HCC) (GDB) (GE) (GHILOTTICC) (LOUKIANOFF) (FITZSIMONS) (BUSH) (DMCI) (ATA1) (TAYLOR) (ECCO2) (AWD) (CAULFIELD) (FOSTER) (STEICO2) (CEI1) (CLKCS) (EUCA1) (AE) (CSIA) (RMMC2) (ECCO5)
- 2. Comment:** In many cases, the useful life of heavy equipment can be measured in decades. It seems unreasonable to restrict the use of such equipment at this place and time. (NDA) (STOWE1)
- 3. Comment:** I suggest that the place to focus on making substantive improvements is with manufacturers, and the fuel. A retrofit and/or a complex set of rules and exceptions will simply hamper the progress of our state towards upgrading our infrastructure. The costs will be borne by the public, and must be fully and accurately considered, by an independent unbiased and non political technical group. (RONSIN2)
- 4. Comment:** Big Creek Lumber Company believes that the fair and effective way to lower off road diesel emissions is to create a standard for all new equipment sold and/or delivered in the state. This would allow businesses to follow their depreciation timelines for existing equipment. (BCL)
- 5. Comment:** The regulation reflects a “Polluter Pays” philosophy which supposes a level of malice on the part of industry that simply isn’t there. (HCC)
- 6. Comment:** Fleets should be given time to replace or repower equipment over a few years and not all at once. We cannot simply throw away the existing machines; reasonable timetables and a transition plan must be put in place to phase in a new generation of cleaner heavy equipment for use both in cities and forests. (BKE) (TAYLOR)
- 7. Comment:** I suggest that the place to focus on making substantive improvements is with manufacturers, and the fuel. (RONSIN1)
- 8. Comment:** It would be appropriate to impose similar requirements on manufacturers of off-road diesel equipment. Until the equipment that meets your proposed requirements becomes available, it is patently absurd to require contractors to buy it. (EUCA)

- 9. Comment:** By arbitrarily imposing retroactive requirements on the end users of diesel equipment, instead of setting new standards for manufacturers, the proposal would have a massive financial impact. (PILCONIS)
- 10. Comment:** I did not have this regulatory obsolescence built into my business plan. (STOWE2)
- 11. Comment:** It would seem to me that the reasonable approach to this issue would be to mandate that any new equipment sold or any used equipment brought into the state meet your proposed criteria after a certain date. Then let the existing equipment (and operators) die a natural death. (GE)
- 12. Comment:** The regulation is unfair and unreasonable because the billions in cost to repower and replace usable equipment must be financed by the construction companies. (PCCA)

Agency Response: As described in Chapter II, Section F of the Staff Report, off-road engine standards, adopted by both U.S. EPA and ARB, have required new off-road engines to become progressively cleaner since the mid 1990's, and manufacturers of off-road engines are required to meet these new engine standards. The most recent tier of engine standards, Tier 3, became effective in 2006, and the next tier, Tier 4, will begin to be implemented in 2008.

Both U.S. EPA and ARB also have requirements for fuels that have made fuels burn cleaner over time. However, ARB's requirements significantly exceed those of the U.S. EPA in that ARB requires all diesel fuel sold in California to be ultra-low sulfur diesel fuel, whereas U.S. EPA does not require off-road diesel fuel to meet this standard until 2010. Also, ARB requires California diesel fuel to have a lower aromatic hydrocarbon content than U.S. EPA does, providing a seven percent NOx benefit relative to federal diesel fuel. The requirements for ultra-low sulfur diesel fuel are discussed in more detail in Section A of Chapter VIII of the Technical Support Document.

As described in Chapter VI, Section A of the Staff Report, NOx and PM emissions are both projected to drop from now through 2020 due to the introduction of increasingly cleaner off-road engines, even in the absence of the regulation. However, the proposed regulation would accelerate these anticipated emission reductions. For example, the PM emission inventory projected for 2020 with the regulation in place would not be reached in the absence of the regulation until after 2025. Because of the health impacts occurring due to emissions of diesel PM and NOx (as described in Sections B through D of Chapter II of the Staff Report), further emission reductions beyond those solely expected from the off-road engine standards are needed.

Staff does not agree with the comments that the requirements of the regulation are imposed arbitrarily. They were developed only after careful consideration and a thorough and lengthy public process, as described further in the Staff Report. If the regulation was structured to simply wait for normal turnover and let the new engines “trickle” through the fleet, or if it simply imposed requirements on new purchases, the significant health benefits of the regulation would be foregone. As described in Section B, Chapter VI of the Staff Report, these health benefits include the prevention of 4,000 premature deaths. Also, ARB needs to accelerate NOx and PM reductions from off-road vehicles so that areas of the state that do not meet NAAQS for PM2.5 and ozone can come into attainment. As identified in the SIP, in-use emission requirements for off-road vehicles are necessary for the State to meet the NAAQS. Failure of the State to meet these standards could result in potential penalties in the form of the federal government withholding transportation funding.

While staff is not attempting to penalize the owners of off-road vehicles, staff acknowledges that the regulation does impose requirements on end users of these vehicles. ARB staff does not ascribe any blame to affected fleets for having older off-road vehicles subject to this regulation, nor do we assume any malice or intent to pollute on the part of affected fleets. We also recognize that these requirements could not have been foreseen when the end users purchased these vehicles years ago. However, we still have concluded the regulation is affordable, as documented in Chapter III-A-3 of this FSOR.

As discussed in Section A of Chapter IV of the Staff Report and described further in the discussion on affordability in Chapter III-A-3 of this FSOR, and the discussion on regulatory provisions in Chapter III-A-6 of this FSOR, the requirements of the regulation are designed to allow fleets to phase-in the introduction of cleaner vehicles over time. Because the regulation sets a maximum cap on the requirements for annual turnover and retrofitting, fleets that start out very dirty or that happen to own very long-lived equipment and who cannot realistically meet the fleet average targets, especially in the early years of implementation, have an affordable path to compliance. The older fleet can comply in the earlier years with 8 percent turnover of the total fleet horsepower per year, and 20 percent retrofit of the total fleet horsepower per year, regardless of whether they meet the fleet averages.

We acknowledge that the regulation will force the accelerated turnover of vehicles, thereby shortening their useful life. Costs for accelerated turnover were included in the cost estimates prepared for the Staff Report and Technical Support Document. The availability of vehicles and retrofit devices to meet the requirement of the regulation is discussed further in Chapter III-A-2 of this FSOR.

See also the response in section III-A-3)f)iii) of this FSOR for a discussion regarding the regulation’s impact on infrastructure.

13. Comment: CARB should be encouraging the development of these control systems that will help equipment owners clean up construction equipment. Instead, CARB is putting the caboose in front of the engine and placing the emissions enhancements on the backs of the end users. As equipment owners, we do not have the technical experience to find the answers to emissions – engine emissions - , but the manufacturers do. (ECCO7)

Agency Response: Staff agrees that ARB should take a leadership role in encouraging the development of VDECS. Chapter III-A-2 of this FSOR further describes ARBs efforts to encourage the development of VDECS that will help equipment owners clean up construction equipment. Such efforts include the \$5 million Off-Road Showcase demonstration project.

As discussed further in Chapter III-A-2 of this FSOR, it is also important to note that the regulation in section 2449.2(a)(2)(A)4. contains provisions that if no VDECS is verified, then none need be installed.

14. Comment: We need a clear third party to judge the impact and set priorities. Imposing regulations on an existing fleet may be ineffective and overwhelming. (RONSIN1) (RONSIN2)

Agency Response: The law has vested ARB, as the expert administrative agency, with authority to determine the emission reduction programs necessary to address California's air quality problems. (H&SC §§ 39602, 39650 et seq., 43013, and 43018).

15. Comment: Adding these new regulations to off-road diesel equipment will benefit the manufacturers of this equipment. The users may not be able to pay the ever increasing prices of the equipment. (AANESTAD)

Agency Response: We acknowledge that the regulation will accelerate the turnover and retrofit of off-road vehicles, and will lead to additional business and sales for manufacturers and dealers of off-road vehicles and VDECS. However, as discussed further in the responses in section 2)c) of Chapter III-A-2 of this FSOR, because we do not expect the regulation to significantly increase the overall national demand for new vehicles, we do not believe the regulation will cause the price of new vehicles to increase. We also believe the prices of VDECS are likely to come down from where they are now due to increased competition in the marketplace as additional devices become verified and economies of scale. Finally, we believe the regulation is affordable for affected fleets. Please see the responses in section III-A-3)a) of this FSOR for a discussion of the affordability of the regulation.

6)a)i1) Make Exceptions for the Oldest Machines That are Near the End of Their Working Lives

- Comment:** Make exceptions for the oldest machines that are near the end of their working lives. Eventually, they break down and are too expensive to fix. (PINETTE1)

Agency Response: We do not agree with this suggestion. As discussed above in the response in section III-A-6)a)i), If we waited for normal turnover (machines breaking down and no longer being worth repairing), we would forego the health benefits of the regulation. The need for emissions reductions from this regulation is discussed further in Chapter III-A-1 of this FSOR.

The oldest machines are the dirtiest, and so are the highest priority for control. Until the mid 1990s, off-road diesel engines were not subject to any emission standards. These engines commonly known as Tier 0 or uncontrolled engines emit large amounts of soot or particulate matter (PM) and oxides of nitrogen (NOx), which are toxic, and pose a major health risk. Figure V-2 of the Technical Support Document illustrates that today's Tier 3 engines are about 60% cleaner than Tier 0 engines, and that Tier 4 engines will be cleaner still.

Because Tier 0 vehicles still represent such a large fraction of the emissions inventory of off-road vehicles, it would not be possible to exempt them and still achieve the emission reduction goals of the regulation. In 2005, Tier 0 engines used in construction and mining vehicles were responsible for 11.0 tons per day of diesel PM and 170 tons per day of NOx emissions. (This data was presented at public workshops to discuss the in-use off-road diesel vehicle rule held in Sacramento, Los Angeles, and Fresno, on December 18th, 20th & 21st, 2006.) The majority of off-road diesel vehicles in 2005 were still Tier 0 (52 percent) (Figure VI-2 of the Technical Support Document). Because of the long useful life of many off-road vehicles, in 2020, 8 percent of the equipment population is still expected to be Tier 0.

6)a)ii) Geographic Provisions

- Comment:** We are concerned that the regulation is designed to achieve drastic emission reductions in the severe or extreme federal non-attainment areas, but there are rural areas in the State that do not need drastic emission reductions. While this is a "one size fits all" regulation, and the provision for low-population counties is helpful, we request additional flexibility. (SVBAPCC) (BCAQMD)

Agency Response: The regulation contains several provisions that will give relief to the rural areas of the state, especially those where the air is already relatively clean - the low-population county provisions and the captive attainment area fleet provisions. As the commenter acknowledges, the low-population county provisions allow county municipalities in low-population counties to be

defined as small fleets (and therefore meet later compliance dates and be exempt from the NOx provisions) even if their horsepower exceeds 2,500 hp. The captive attainment area provisions exempt all fleets that operate in counties that attain the federal ambient air quality standards and that do not contribute to downwind exceedances of the state ozone standard from the regulation's NOx requirements. Some of the low-population county municipalities are captive attainment area fleets.

Rural areas that are designated as non attainment for either the ozone or PM2.5 federal ambient air quality standards, or that contribute to downwind exceedances of these standards, were not exempted from the NOx provisions of the regulation. This is because NOx reductions in those areas are needed to help attain these standards.

Because diesel PM is a toxic air contaminant, and significant reductions of diesel PM are necessary to meet the goals of the Diesel RRP, we do not believe it is appropriate to also exempt fleets captive to attainment areas from the PM requirements of the regulation. Diesel PM, even if emitted in a rural area, may still negatively affect the operator of the vehicle, as well as any nearby receptors (people). Thus, emission reductions of diesel PM are beneficial even in areas that attain the ambient air quality standards for criteria pollutants.

We did not incorporate additional rural area provisions in order to keep the regulation as simple, uniform, and easy to enforce as possible. Staff believes that further regional requirements would cause confusion while complicating enforcement.

6)a)ii)1) Do Not Have Region-Specific Requirements

- 1. Comment:** The regulation should not contain region-specific requirements. Regional requirements in addition to state requirements will cause confusion and hardship. There needs to be certainty in the regulation in that it affects future purchase decisions. Some members operate throughout the state and move equipment in and out different regions. The idea that there might be more than one regulation to deal with is troubling. (ARA4)
- 2. Comment:** I would like consistency and certainty coming from the Board. The South Coast and the San Joaquin Valley have expressed their concerns and potentially local districts could ask for their own authority to come up with a rule. I have to go to my management with certainty on how we're going to comply with this regulation. Our initial strategy, which only covers, say the first three years of our strategy, is [estimated to cost] upward of \$15 million. The last thing we need is the uncertainty of possible dual regulations. Essentially a different regulation from a different authority could really throw a wrench in the works. (CAPONI)

Agency Response: Staff agrees that regulations need to be simple and as uniform as possible. Regional requirements that are separate and distinct from the state requirements could cause confusion and result in inability of fleets to comply with the regulation, as well as lead to enforcement issues

However, as discussed further in Chapter III-A-19 of this FSOR, under California law, local air pollution control districts and air quality management districts have independent authority to address emissions from indirect sources, a site that does not directly emit emissions but attracts emission sources to the area. Additionally, diesel PM is a carcinogen and has no safe threshold below which there is no risk. Under the federal Clean Air Act and state law, local agencies could choose to impose in-use operational controls, such as idling and hours of use restrictions, or other requirements that do not directly affect design and manufacture of engines. Additionally, local jurisdictions have authority under the California Environmental Quality Act (CEQA) to review the environmental impact of local projects and determine whether they cause significant environmental impacts that must be addressed by consideration of alternatives to the proposed project or mitigation measures that must be taken.

In addition, as is discussed further in Chapter III-A-9 of this FSOR, there are certain regions of the state that require additional NOx emission reductions, and the Board approved provisions in the regulation allowing local air districts in the state to opt into certain provisions of the regulation intended to achieve surplus emission reductions of NOx.

6)a)ii)2) Have Tighter Requirements for Some Regions

- 1. Comment:** The South Coast Air District requests stricter NOx emissions in the South Coast. The South Coast region has a disproportionate exposure to PM2.5 and ozone, due to the location between major trucking and shipping lanes. By 2024, there are still more than 180 tons of NOx reductions undefined in the so called black box for the South Coast's 8-hour ozone attainment demonstration. The State is unlikely to have a second chance at this source category. The new regulations do not cut off-road diesel NOx emissions as much as the state's strategy to cut emissions from other NOx source categories, including heavy duty trucks and ocean vessels. (SCAQMD3)
- 2. Comment:** The San Joaquin Valley Air District needs more NOx reductions to get achieve attainment of the federal air quality standards. Mobile sources, both on-road and off-road, are the largest source categories contributing to NOx emissions. The San Joaquin Valley Air District just recently adopted an eight-hour ozone plan, which shows that a 75 percent reduction in NOx emissions, from a 2005 baseline, is necessary to bring us into attainment with the federal eight-hour ozone standard. Right now this rule gets about a 61 percent reduction. We think the regulation should be made more stringent to get a higher percent

reduction in NOx emissions. This could be done regionally, limited to regions that are designated as serious or extreme ozone non-attainment areas, and for the upwind areas that transport pollution to such non-attainment areas. (SJVAPCD2)

3. **Comment:** There should be a more aggressive timeline in those areas in crucial need of significant emission reductions, like the San Joaquin Valley and the South Coast Air District. (CAPCOA2)

Agency Response: We recognize the urgent need for further reductions of NOx emissions in the South Coast and San Joaquin Valley Air Districts. Toward this end, the Board approved the inclusion of the Surplus Off-road Opt-in for NOx (SOON) program, which was fully set forth as part of the Second Notice of Public Availability of Modified Text and Availability of Additional Documents (released on February 5, 2008). SOON is designed to achieve additional NOx emission reductions beyond what is required by the regulation in local air districts that opt into this program.

See also Chapter III-A-9 of this FSOR for further description of the SOON program. See Chapter III-A-8 of this FSOR for a discussion of specific alternative proposal presented to ARB by the South Coast Air District.

6)a)iii) Add Geographic Zones

1. **Comment:** A statewide standard is not fair to geographically different zones. The regulation should accommodate elevation, temperature, moisture, wind and other climatic factors that will require different diesel standards. (ASA)
2. **Comment:** Due to climatic and soil conditions Central Valley has a nine-month construction season as compared to Southern California which has a 11-12 month season. Hence revise the regulation to make it more site specific taking into consideration environmental and soil conditions. (DCCI)

Agency Response: We recognize that because of climate differences construction vehicles in Southern California generally operate for a longer season and more hours per year than those in Northern California. However, we do not recommend adopting varying requirements for various parts of the state based on climate alone. In addition to achieving emission reductions, a regulation needs to be simple, feasible, and enforceable. We attempted to keep the regulation as uniform geographically as possible for this reason. Having different requirement targets for northern, central and southern areas would lead to compliance issues especially for vehicles that moved throughout different areas of the state. Enforcing the regulation would also become more complex.

Having said that the regulation does make some geographical distinctions based on whether the fleet is a municipality in a low-population county (see section 2449(d)), whether a fleet is captive to an attainment area county (see section 2449.1(a)), and whether a district elects to opt into the SOON program (see section 2449.3).

6)a)iv) Regulatory Authority for Leased Equipment Inadequately Addressed

1. **Comment:** Who should be responsible for compliance with the fleet requirements of the proposal for equipment that is rented or leased? The Industrial Truck Association (ITA) submits that the only reasonable answer to this question is that the end user, the party that actually uses the equipment to perform some job, should have the compliance responsibility under this in-use regulation. This was the approach taken, after careful consideration, in the fleet regulation for in-use off-road Large Spark-Ignition (“LSI”) equipment. Rather than adopting the same commonsense approach for diesel equipment, however, the current proposal purports to allocate the compliance responsibility for rented and leased equipment between the equipment dealer and the end user according to a matrix that depends upon (1) the length of the contract term; (2) the language of the contract; and (3) the nature of the contract. This break with the LSI approach for diesel equipment reflects no meaningful difference between LSI and diesel equipment relevant to a fleet rule, but simply a lack of basic coordination within the agency. (ITA)

Agency Response: We disagree. Staff believes that a one year threshold is a reasonable amount of time that a lessee should have a piece of equipment in their possession before a leasing entity could potentially pass compliance responsibility to the lessee. We do not believe that it makes sense for someone who is renting a piece of equipment for a short amount of time to be responsible for retrofitting, turning over, or meeting fleet averages.

Let us assume that an individual wants to rent a backhoe for a week. Under ITA's proposal that individual would need to research buy and install a retrofit on a piece of equipment that they are using for 7 days. Then, when that week is up and the vehicle is returned the lessee could or could not remove the retrofit device and keep it for the next time they would need to rent a vehicle. This is clearly unreasonable and illustrates why the default responsibility for complying with the regulation belongs on the owner, not the user.

Our regulation does however give the leasing fleet the opportunity to pass compliance responsibility onto the lease via “terms written into the lease agreement” if that lease is over one year and the lessee agrees to the terms. We recognize that this approach is different from the Large Spark-Ignition (LSI) rule. ARB staff working on the off-road regulation coordinated numerous times throughout the development of the regulation with the staff who worked on the

LSI rule, but decided that the approach taken in the LSI rule was not appropriate for this regulation. The vehicles covered under the off-road regulation are different and are much more likely to require retrofit than the vehicle covered by the LSI regulation so the lessor/lessee requirements need to be different. For more information on the compliance requirements of rental and lease companies, please refer to section C.4. in Chapter VI of the Technical Support Document.

6)a)v)1) Exempt Everything Below 50 Hp

1. **Comment:** The legislation is targeting 25 hp diesel and up - if you had said 100 hp and up I might have understood. (MILLIGAN)
2. **Comment:** We therefore suggest that you consider as an alternative a threshold of 50 horsepower and greater engine. (SEC)

Agency Response: We disagree. Low-horsepower vehicles represent a significant portion of the vehicle population and are responsible for a significant portion of NOx and PM emissions from off-road diesel vehicles. Vehicles in the 25-49 hp range comprise nearly 20 percent of the total population of vehicles covered by the regulation and are responsible for approximately 5 percent of NOx and PM emissions. Vehicles in the 50-99 hp range comprise over 40 percent of the total population of vehicles covered by the regulation and are responsible for over 20 percent of NOx emissions and over 30 percent of diesel PM emissions.

If the vehicles from either or both horsepower groups were omitted from the regulation, a loss in emission reductions, health benefits, and lives saved would occur. In addition, these engines do fall within the EPA's benchmark for value of avoided death (at \$248/lb) because of cost effective retrofit options available, and the ability to buy used vehicles or repower as low cost compliance options. For a more detailed discussion the importance of the emission reductions from the regulation, please see the responses in Chapter III-A-1 of this FSOR.

6)a)v)2) Exempt Non-profits and Training Facilities

1. **Comment:** Please insert the following exemption that could be written into section 2449(b) by adding to the last paragraph of (b), "State approved apprenticeship training programs and other non-profit or not for profit organizations who utilize off road equipment solely for the purpose of training are exempt from the provisions of this regulation". (REYES)
2. **Comment:** Job Corps is a vocational training program for at risk youth between 16-24 years of age operated by the Federal Labor Department. Job Corps has 118 Centers through out the United States and territories. The IUOE has a national training contract to operate 11 heavy equipment programs within the Job Corps system. Sacramento is home to one of the

heavy equipment/mechanics training programs. This program is the only one in California. The only equipment that is accessible to our training program is excess GSA equipment. Most of our equipment is surplus military that is 30 to 40 years old. Without a consideration for training centers, our program would end. (IUOE1)

3. **Comment:** "...exempt training facilities from the requirements of this regulation. Our training facility operates as a not for profit educational facility on a fixed and limited income and is unable to pass costs on to the consumer as the staff proposes industry does." (OE2)
4. **Comment:** We would also request an exemption for nonprofit training institutes so the Job Corps notice can continue to train the members of tomorrow. (OE4)

Agency Response: We agree. Per section 2449(e)(13), vehicles used by the Job Corps nonprofit apprenticeship training programs are exempt from the performance requirements in the regulation but still must be labeled and reported in accordance with sections 2449(f) and (g). This addition to the regulation was made as part of the modifications that were contained in the First Notice of Availability of Modified Text.

6)a)v)3) Exempt Certain Activities

1. **Comment:** Provide exemptions for emergency or safety-related activities such as mastication and fuel clearing operations, tree removal, and similar services. (NEVADA)

Agency Response: Per the provisions in section 2449(e)(3), vehicles used solely for emergency operations are exempt from the performance requirements in sections 2449(d), 2449.1(a), 2449.2(a) and 2449.3(d) but still must be labeled and reported in accordance with sections 2449(f) and (g). Vehicles used solely for emergency operations need not be included when calculating fleet average indices or target rates, when determining fleet size, or when calculating the required horsepower for the BACT turnover and retrofit requirements in sections 2449.1(a)(2) and 2449.2(a)(2).

Owners of vehicles brought into California for emergency operations that last longer than three months must report such entry to ARB and request an equipment identification number within three months of entering the state. Vehicles used solely for emergency operations and that stay in California for less than three months do not have to be labeled. For vehicles used both for emergency operations and for other purposes, hours of operation accrued when the vehicle is used for emergency operations do not need to be included when determining whether the vehicle meets the low-use vehicle definition.

2. **Comment:** Please take action to exempt landfill/recycle operators from the new rule. (WATKINSON)

Agency Response: We disagree. There is no justification given as to why landfill/recycling operations should be exempt from the off-road regulation. The fleets at landfills/recycling centers are no different from other fleets located in California and therefore, are subject to the regulation and must adhere to the same PM and NOx requirements as everyone else.

6)a)v)4) Allow Retrofit Vehicles to Operate Indefinitely

1. **Comment:** We need to be allowed to keep retrofit equipment in place for the life of the existing equipment. Please allow retrofitting of the existing fleet for the remaining life of the existing equipment. (AWD)
2. **Comment:** If the VDECS technology is that practical, and we can get compliance on a Tier 4 or Tier 5 basis with those additions, then why do we have to get rid of those pieces of equipment at all. (AAWC2)

Agency Response: We disagree with the commenters' that retrofit equipment should be allowed to remain in the fleet without being turned over. Although VDECS will reduce PM emissions, at this time, none of the VDECS verified for off-road use will reduce NOx. Replacing, repowering, or retiring older, dirty vehicles is currently the most effective means of reducing NOx. However, if retrofit devices that do achieve NOx emissions are verified, the regulation provides credit for the use of such devices towards complying with the BACT provisions, and also allows fleets to take credit for the NOx reduction towards their fleet average obligations.

Staff feels that the current provisions in the regulation regarding retrofits provide sufficient economic protections to fleet owners that install VDECS. When a fleet owner installs a retrofit device, the regulation provides a six year exemption from turnover and thus guarantees the life of the device over this period. Also, the regulation allows retrofit devices to be removed from a vehicle that is to be sold out-of-state or retired. Those VDECS could then be used on replacement vehicles or sold (assuming the device is verified for the engine in that particular replacement vehicle and the reuse or sale of the VDECS meets any other provisions of its verification Executive Order).

6)a)v)5) Exempt Rail Equipment

1. **Comment:** Much of the Tier 0 equipment has not yet worked its useful life, and because of the nature of the rail specific equipment, would fail to sell on the open market. We strongly urge the Board to preview this rail specific equipment at our Bakersfield facility to validate the unique nature of this equipment that, under this rule, would become scrap decades ahead of scheduled retirement. (BNSF)

2. **Comment:** I would imagine a class action suit could become an option as I do not see the railroads having to take part in any of this. (DALES)

Agency Response: The regulation does affect railroads. Except for the two exceptions described below, self propelled off-road diesel vehicles 25 horsepower and above that operate at rail yards are subject to this regulation. Except as provided below, fleet owners that operate at rail yards must comply with the regulation just like any other fleet owner.

The two types of rail yard equipment that are exempt from the regulation are: Cargo handling equipment at intermodal railyards that is already subject to the cargo handling regulation (title 13, section 2479); and new locomotives and locomotive engines, which are preempted by federal law. Efforts to reduce emissions from locomotives are described further in the following two paragraphs.

ARB and the two Class 1 railroads that operate in the State, Union Pacific Railroad (UP) and BNSF Railway (BNSF) have been working cooperatively to reduce PM and NOx emissions from locomotives throughout California for the past decade. In July 2007, ARB and the two railroads entered into a memorandum of understanding (MOU) that requires that the railroads have a fleet emission average equal to the federal Tier 2 emission standard for new locomotives by 2010. This is resulting in the early entry of Tier 2 engines into the State. On June 30, 2005, ARB entered a second MOU with the two railroads.

The 2005 MOU requires the railroads to expeditiously implement a number of feasible and cost-effective measures to reduce emissions from locomotives throughout California. The Agreement initiated cooperative efforts between the railroads and the ARB to assess and mitigate public health risks around 17 major rail yards throughout the State. The Agreement includes provisions for ongoing public involvement at each major rail yard, where community and environmental justice concerns can be addressed directly. Additionally, the agreement limits idling times of 15 minutes with automatic idling devices and 60 minutes without an idling device for both intrastate and interstate locomotives operating in California. The MOU is expected to achieve 20 percent near-term emission reductions. The MOU can be found at:

<http://www.arb.ca.gov/railyard/ryagreement/ryagreement.htm>.

On November 18, 2004, the ARB approved new requirements for fuel used in interstate and intrastate locomotives. Beginning January 1, 2007, diesel fuel sold for use in interstate and intrastate diesel-electric locomotives operating in California must meet the specifications of CARB diesel fuel. Intrastate (diesel-electric) locomotives are defined as those locomotives that operate and fuel primarily (at or greater than 90% of annual fuel consumption, mileage, and/or hours of operation) within the boundaries of the state of California. More

information about these fuel requirements can be found at
<http://www.arb.ca.gov/msprog/offroad/loco/loco.htm#intrastate>.

In many cases, interstate locomotives are beyond ARB's authority and are subject to only federal standards. For more information on the federal locomotive program please visit <http://www.epa.gov/otaq/locomotv.htm>.

On March 14, 2008, U.S. EPA finalized new Tier 3 and 4 emission standards for new locomotives. It is ARB's intent to engage the railroads in future MOUs, like the 1998 MOU, to achieve accelerated entry of these locomotives into California. Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less than 30 Liters per Cylinder,
____Fed.Reg_(2008)

We recognize that the regulation will impose costs on affected fleets, including railroads, and that those costs include the cost of accelerating turnover of tier 0 vehicles. The cost and economic impact of the regulation is described in Chapter XI of the Technical Support Document. Please see also the responses in Chapter III-A-3 of this FSOR for a discussion of costs associated with retirement tier 0 vehicles.

6)a)v)6) Extend Low-Population County Exemption

- 1. Comment:** In high pollution areas, I can see the necessity to do some kind of mitigation, but in Mendocino County, I do not see the wisdom of harming many farmers and small operators. (PINETTE1)
- 2. Comment:** In all your statistics on health and life loss from the subject equipment, your basin studies assume uniform distribution of the data over the entire basin. WRONG! I live in Trinity County with a total population of 13,500 and 78% of the land is owned by the U.S. Government. (MURRAY)

Agency Response: In approving the regulation, the Board recognized the differing needs of rural counties like Trinity and Mendocino, and the regulation contains provisions to address these needs. First, the regulation contains special provisions for low-population county municipalities – counties with a population less than 125,000 -- in recognition of the special challenges faced by municipalities in rural areas. The regulation also exempts from the NOx provisions of the regulation fleets captive to attainment areas that are also not upwind contributors to downwind ozone exceedances. Trinity and Mendocino Counties qualify for both of these provisions; as they are low-population counties, and are federal attainment areas county that does not contribute to downwind ozone violations.

The regulation contains provisions designed to minimize financial impacts on farmers and small operators. Vehicles exclusively in agricultural operations are

completely exempt from the regulation's requirements, including its performance, labeling, and reporting requirements. A vehicle that is used by its owner for agricultural operations for over half of its annual operating hours but that is not used exclusively for agricultural operations is exempt from the performance requirements in the regulation, but still must be labeled and reported in accordance with sections 2449(f) and (g). A vehicle that is rented or leased for use by others is exempt only if it is exclusively used for agricultural operations.

Aware of the potential economic costs of the regulation on small operators, the Board included in the final regulation special provisions for small fleets, including an exemption from the NOx requirements, a delayed start date (to 2015), and a later final compliance date for the PM requirements. See the response to comment III-A-6)b)iv)1) in Chapter III-A-6 of this FSOR for further discussion of the small fleet provisions.

Commenter PINETTE1 incorrectly claims that ARB assumed uniform distribution of the data over entire air basins. In the emissions inventory and modeling that underlies the rulemaking, we modeled individual county populations of off-road vehicles. Also, in the health impacts modeling, we modeled the emission reductions and health impacts county by county. Finally, the photochemical modeling that underlies that State Implementation Plans which drives, for example some of the goals of this regulation (i.e., the NOx reductions) models air movement and chemistry in grid cells that are only several kilometers across.

6)a)v)7) Exempt Agricultural Vehicles

- 1. Comment:** Farmers that use their equipment for their own use will find it difficult to pay the cost of the retrofit. (PATTERSON)
- 2. Comment:** This will be devastating for us who are small farmers. (FV1)

Agency Response: We agree. A vehicle used exclusively for agricultural operations is completely exempt from the performance, labeling, and reporting requirements. A vehicle that is engaged in agricultural operations for more than half of its annual operating hours, but not exclusively, is exempt from the performance requirements of section 2449(d), 2449.1(a), and 2449.2(a), but still must be labeled and reported in accordance with sections 2449(f) and (g). A vehicle that is rented or leased for use by others is exempt only if it is exclusively used for agricultural operations.

6)a)v)8) Exempt Low-use Vehicles

- 1. Comment:** I operate 2 older pieces of equipment in my business. One is a 1984 Backhoe (63 hp) and the other a 1998 Skid Loader (61 hp). Both of these machines are used approximately 100 hours per year. It would not be cost effective to retrofit or replace these machines due to the low usage. If the new regulations proposed are adopted I would be forced to

retire the machines with no resale value and use rental equipment. My ability to be competitive in the small amount of work I do with these machines is based on low equipment costs. I would be forced out of the small contractors market. I feel there should be some sort of exemption for small fleets and small business. (PAULSELL)

2. **Comment:** A lot of this equipment doesn't run 4 hours per year - how could they have that large of a problem? Many of them can not be upgraded – this would be a very large burden on small operator and very unfair. (YOUNG)

Agency Response: We agree. Low-use vehicles, those used less than 100 hours per year, are exempt from the performance requirements in sections 2449(d), 2449.1(a), 2449.2(a) and 2449.3(d) but still must be labeled and reported in accordance with sections 2449(f) and (g). Low-use vehicles need not be included when calculating fleet average indices or target rates, when determining fleet size, or when calculating the required horsepower for the BACT turnover and retrofit requirements in sections 2449.1(a)(2) and 2449.2(a)(2).

The fleet owned by commenter PAULSELL has a total horsepower of 124 horsepower and therefore would be defined as a small fleet. Thus, even if it exceeds the low-use usage threshold of 100 hours per year, it will be exempt from the NOx provisions of the regulation. Commenter PAULSELL will not be required to retire any vehicles, nor will he have to comply with any of the PM requirements before 2015.

6)a)v)9) Exempt Private Use

1. **Comment:** Individual homeowners that own a piece of diesel equipment for private use are not a significant source of pollution. In addition, the cost to these individuals to comply with the proposed regulations would be prohibitive. ARB should consider a grandfather clause to cover the equipment already owned by individuals for private use. (BROWND)
2. **Comment:** To require homeowners who have a few acres and have a tractor or generator that is seldom used and have no way to recuperate the money spent for the retrofit is wrong. Equipment owned by individuals, that is seldom used for their own use should be excluded from the requirements. (PATTERSON)
3. **Comment:** The regulation targets the average home owner with his little Kubota lawn tractor. (MILLIGAN)
4. **Comment:** As a forest land property owner, the cost of equipment to smog my L-35 back hoe would not be cost efficient for number of hours used annually. (PALATINO)

5. **Comment:** I have one backhoe and only use it a maximum of 200 hrs per year around my acreage. To be forced to spend money on an exhaust update system is not only unnecessary but impractical. (MURRAY)
6. **Comment:** I have a backhoe that only gets used a couple of times a year. We have never used it to make money. It is unfair to burden me and those in my position with these new regulations. (ROPER)

Agency Response: Staff agrees that the regulation should not target individual homeowners using equipment for personal use. Thus, section 2449(b) specifies that off-road diesel vehicles owned and operated by an individual for personal, non-commercial, non-governmental purposes are exempt from the provisions of the regulation. Also, portable equipment such as generators is not covered by the regulation.

6)a)v)10) Extend Exemption for Vehicles Awaiting Sale

1. **Comment:** The large scale of equipment replacement required by the regulation makes us skeptical we will always be able to find a sales yard with room for our retired or replaced equipment. The exemption for vehicles awaiting sale should apply to fleet owners, as well as dealers and financing companies. The exemption should apply to vehicles awaiting transport to a sales yard as well as to vehicles awaiting sale. (CALCIMA)

Agency Response: The regulation in section 2449(e)(10) contains an exemption for vehicles awaiting sale. This exemption applies to dealers and financing companies and other entities. While the initial intent of section 2449(e)(10) was limited to dealers and financing companies that serve as middlemen during a sales transaction, there may be certain limited times when fleet owners could be one of the “other entities” that could potentially use this exemption. However, staff believes that the low-use provisions in the regulation are more appropriately used by fleet owners when they have vehicles that are waiting for sale. The low-use provisions provide a mechanism for fleets to not retrofit or turnover vehicles that are not being used extensively (i.e., their use drops below 100 hours per year and the fleet commits to keep their usage below 100 hours per year). Such vehicles can be designated as low-use vehicles per section 2449.1(a)(2)(A)6 in the regulation.

6)a)v)11) Exempt Small Fleets

1. **Comment:** The regulation should include an exemption for very small operations, upon which the regulation would be unduly burdensome. (PB)

Agency Response: We understand that small operations have fewer available resources to comply with the regulation than larger ones, and that, overall, they may have a more difficult time complying with the regulation. That is why the regulation provides small fleets additional time to come into compliance. Small

fleets, those with 2,500 horsepower or less, do not need to begin complying with the PM provisions until 2015, and are completely exempt from the NOx provisions of the regulation. That means that small fleets are not subject to any accelerated turnover requirements. The small fleet performance requirements are contained in section 2449.2(a)(1)(B) of the regulation. In addition, the regulation does not apply to vehicles used by an individual for personal, non-commercial and non-governmental purposes, and does not apply to vehicles used predominantly in agricultural operations – other categories that might include what the commenter describes as very small operations.

6)a)v)12) Section intentionally left blank.

6)a)v)13) Exclude New Tier 3 Machines from Fleet's Overall Hp

1. **Comment:** If companies choose to comply by buying newer machines, then the Tier 3 machines or above should be excluded from their overall horsepower, so that purchase of newer machines does not penalize them and put a heavier burden on the older machines. (AAWC2)

Agency Response: We disagree that Tier 3 and 4 vehicles should be excluded when calculating a fleet's overall horsepower. The exclusion of Tier 3 and 4 vehicles would reduce the emission reduction actions required by the regulation and shift more fleets into the small and medium categories rather than the large fleet categories. This shift would in turn result in a delay in the emission reduction benefits and would lead to increased health risks and increased mortality due to NOx and PM emissions. To avoid this delay in benefits and increased health impact, the regulation would have to be revised and made more stringent to provide equivalent emission reductions.

It is important to note that the regulation provides special credit for replacing a lower tier vehicle or engine with a Tier 4 vehicle or engine. Section 2449.2 (a)(2)(A)1.a., Turnover to Tier 4 In Lieu of Retrofitting, describes how a fleet obtains carryover retrofit credit in the amount of the total horsepower replaced by Tier 4 machines.

6)a)v)14) Exempt San Clemente and San Nicolas Islands

1. **Comment:** Modification or replacement of engines should not be required for San Clemente Island and San Nicolas Island, which would be consistent with ARB's action on the Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 Horsepower or Greater.

Agency Response: We agree. A provision exempting San Clemente and San Nicholas Islands was added into the regulation prior to the July, 2007 Board hearing as new section 2449 (e)(12). The modification was described in the First

Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released on December 11, 2007.

6)a)vi) Regulation Unfair to Certain Types of Businesses

- 1. Comment:** Why is there a one size fits all regulation for different sized companies with the noted exception of small companies and public agencies? Through the examples presented, CARB staff demonstrated that this regulation will have significantly varying impacts on companies, depending on what portion of their total revenue is generated by equipment. At one end of the spectrum is a heavy equipment rental company that operates on very thin margins, is not a contractor and does not have the ability to generate revenue beyond a competitive equipment rental rate. The relative impact of this regulation is huge to these companies' operational and financial abilities. On the other end of this spectrum are the heavy contractors that have a relatively low percentage of their revenue generated by equipment. The impact of this regulation on their fleet is "diluted". Yet there is not provision in these proposed regulations for this disparity. (SHAWM1)

Agency Response: We developed the regulation during a three year long public process that included numerous meetings and discussions with affected stakeholders. The special provisions in the regulation, such as those for small fleets and low-population county local municipality fleets, were added to the regulation as a result of stakeholder input.

We recognize that the economic impacts of the regulation will vary among fleets. However, crafting differing requirements for fleets based on the portion of business revenues generated by affected vehicles would have been difficult to accomplish and would have significantly added to the complexity of the regulation. If such an approach had been taken, certain requirements of the regulation would necessarily depend on the financial statements of the fleet owner, and could change with time as his financial situation changes. This would result in significant uncertainty in compliance planning to the fleet operator. Also, this would require the reporting and verification of company financial information at a level that would have not only made the regulation more complex and expensive for ARB to administer, but also intrusive into the financial situation of thousands of private companies in the state.

As discussed in the Chapter VII of the Staff Report, we expect that some fleets will need to pass on compliance costs to their customers in order to remain profitable. For example, a heavy equipment rental company may need to raise the fees it charges for rentals, and a contractor may need to bid higher on jobs. We expect that businesses in similar segments of the industry will face compliance costs that are roughly comparable to those of their competitors. We believe this will allow affected companies to generate additional revenue (ie, raise their prices) to recoup their compliance costs without losing business to

competitors. Finally, as discussed further in the responses in section III-A-3)a) of Chapter 3 of this FSOR, we believe costs of the regulation will be affordable.

2. Comment: As it stands now, cost of fuel and repair parts (tires, pins, bearings) and other normal wear parts for a primarily private use tractor are becoming exorbitant. State mandated fire prevention regulations require property has fire safe boundaries around dwellings and access to same. To maintain a property in excess of 25 acres requires mechanical ability to clear and remove underbrush and fire fuel. For the above reasons and because of the additional cost of complying with this regulation, I believe the regulation would be detrimental to private forest management. (PALATINO)

Agency Response: Homeowners who own their own personal tractor for clearing debris and flammable material from around the perimeter of their home are not subject to this regulation. Per section 2449(b), off-road diesel vehicles owned and operated by an individual for personal, non-commercial, and non-governmental purposes are exempt from the regulation.

Even if they do not fall within this personal-use exemption in section 2449(b), vehicles used for the removal of trees and brush for fire hazard abatement could fall within the exemption for agricultural vehicles provided the vegetation clearing is on forestlands and is part of a commercial harvesting operation as described in section 2449(c)(26), and provided that more than half the vehicle's annual use is for agricultural purposes. See sections 2449(b), 2449(c)(1) and 2449(c)(26). To the extent the commenter is concerned about impacts of the regulation on forest management generally, all vehicles used predominantly in a commercial forest operation fall under the exemption for vehicles used in agricultural operations.

Off-road diesel vehicles used for fire break construction or as part of other forest operations that do not qualify for either of the exemptions described above would be subject to the regulation. For a discussion of the general affordability of the costs of complying with the regulation, see Chapter III-A-3 of this FSOR.

6)a)vi)1) Firms that have been in Business a Long Time

1. Comment: The regulation discriminates against contractors that have been in business more than 10 years, and those who purchased much of their equipment before Tier 1 engines were available. New contractors in business will have only the newer model engines that are not subjected to the considerable expense of upgrading. (DCCI)

Agency Response: As stated in section D.3. in Chapter XI of the Technical Support Document, we acknowledge that the fleets with older vehicles will have higher compliance costs than younger fleets. There are many fleets throughout the state that have been in business for decades, and not all of those fleets have

chosen the strategy of maintaining older equipment. Many fleets, regardless of how long they have been in operation, have chosen to gradually incorporate newer vehicles into their fleet, and therefore currently have a combination of new and old equipment. Additionally, many start up companies purchase used vehicles because they are cheaper. Therefore, the age of a business does not play a significant role in the ability of a fleet to meet compliance deadlines. ARB has taken many steps to ensure fleets with a significant number of older vehicles are able to comply with the regulation; the BACT provisions set limits on the percentage of turnover and retrofitting required each year for compliance. The BACT provisions are expected to give older fleets the benefit of several years to phase out the older dirtier equipment from their fleet to in an affordable manner. Please also refer to the response in section III-A-3)a)i) in Chapter III-A-3 of this FSOR for a discussion on affordability.

6)a)vi)2) Quarrying

- 1. Comments:** Underground mining should be exempt from the regulation for the following reasons:
 1. Currently diesel engines for underground metal mines are regulated under the federal Mine Safety and Health Administration (MSHA) and the state California Occupational Safety and Health Administration (Cal-OSHA). There are regulations already established for diesel engines used underground. These regulations include reporting requirements for every engine used underground and approval prior to use, only certain engines are approved for use, and there is legislation for monitoring and controlling emissions from these engines. All underground diesel engines are equipped with exhaust scrubbers to provide a cleaner workplace environment for employees and to reduce emissions. Your organization should work with these agencies, research existing legislation to determine whether it is adequate, and work to avoid conflicting legislation, regulations, and unnecessary overlap of jurisdictions. It is not efficient use of the taxpayers or the owner's dollars to have multiple agencies collecting exactly the same information.
 2. There is already legislation in place by these organizations to improve the tiers of engines in equipment and all mines monitor emissions and have health and safety plans in place to protect and inform workers of hazards associated with emissions.
 3. In order for your inspectors to inspect underground mines, they will be required to complete 40 hours of MSHA training (Miner training). As engines used underground are already registered by Cal-OSHA and they and MSHA have inspectors, it seems a waste of company

and taxpayer's dollars to set up yet another layer of government red tape for inspections.

4. Underground mining equipment is very specialized in nature. There are only a few manufacturers in the world, and most of the U.S. manufacturers have disappeared. We have a limited choice in equipment and no ability to affect design of equipment which is being manufactured for a global market.
5. We may not be able to purchase equipment with the necessary engines to meet your regulations and we could be penalized for something we cannot control.
6. In underground mining, we need to use specialized contractors for underground development and construction. There are no major mining contractors left in California and we need to import these services from other states or from Canada. We cannot afford to pay to have a mining contractor retrofit their equipment for use in California for temporary work. Instituting your regulations as they are now will significantly impact our industry in the state. At a minimum, underground equipment used by contractors from outside the state should be exempted from your regulations.
7. Underground mining equipment often has diesel engines to move between workplaces and then is operated pneumatically or electrically. It is not justifiable to treat this type of equipment the same way you would a normal piece of diesel equipment.
8. Typically underground equipment is captive in a mine area and gets very low utilization. In many underground mines, equipment utilization is below 25% as compared to greater than 75% for surface equipment. Underground equipment use cannot be viewed the same way as surface equipment use in production of emissions.
9. There is potential to use more electrically powered equipment in underground mines. Credits or incentives should be given for use of alternative types of equipment in underground mining as opposed to penalizing companies for having diesel equipment.
10. Retrofits of engines and new engines often can help reduce emissions. However, typically this means the engine burns much hotter. This creates health and safety concerns for operators in an underground mine. In some instances, fires have resulted, which could result in deaths to employees. This could be a major concern for underground mines.

11. The number of operating underground mines in California is insignificant at this point in time and the associated equipment is a very low number as compared to all the surface equipment that the ARB wants to regulate. In fact, the Idaho-Maryland Mine, currently being permitted in Grass Valley, may be the only underground mine in the state that has a fleet of underground mining equipment. Other mines may have track equipment rather than mobile trackless equipment. From a practical point of view, regulating underground mines will not result in a significant reduction of emissions. The cost of regulation and inspection will likely outweigh the benefits of the regulation in this instance and is not the best use of taxpayer's money. It places an unnecessary financial burden on an industry that is already barely surviving in the state.
12. In most jurisdictions, underground mines are treated as a point source emission from any ventilation shafts, portals, or adits that exist from the mine. This is a much better way to treat emissions from a mine, and these emissions are monitored and reported and regulations are already in place for this.
13. The intent of your regulation is to improve health of California residents that live close to freeways or urban areas where they are getting exposed to emissions from vehicles. Typically mining operations are not located in residential areas and there is no evidence that emissions from underground mines have affected the health or safety of any residents of California. (WATKINSON)

Agency Response: We disagree that underground mining operations should be exempt from the regulation for the reasons stated below. The commenter raised 13 points, and we address them in order below:

1. and 2. The regulation has a different purpose than MSHA and CalOSHA requirements, which are aimed at protecting mine worker safety rather than at protecting ambient air quality and the health of people downwind from a mine. However, staff agrees that it is not good public policy to have conflicting regulatory requirements, and believes that the regulation will not conflict with MSHA or Cal OSHA requirements. In the First Notice of Public Availability of Modified Text and Availability of Additional Documents released on December 11, 2007, the criteria for determining whether a vehicle will be considered exempt from the BACT requirements was added, which includes, that if the use of a Level 2 or Level 3 VDECS would conflict with occupational safety and health requirements, the retrofit is not required. This will ensure that operators can comply with both this regulation and any applicable mine safety laws.

Also, if a mining operation has installed VDECS to meet MSHA regulations or has upgraded to newer engines, that installation or upgrade can count towards compliance with this regulation's fleet average requirements.

3. We understand that special training is needed to inspect underground mines. As ARB has done in the past with other agencies that we have needed to coordinate inspection and enforcement activities (such as with the California Highway Patrol on ARB's Heavy-Duty Truck Inspection Program), ARB staff is optimistic that it will be able to coordinate inspections with MSHA and Cal-OSHA in support of the regulation. However, in spite of this need to coordinate with these other agencies, mining fleets still need to report their data to ARB, and ARB staff will be able to monitor compliance without necessarily having to inspect underground vehicles.
 4. and 5. The regulation provides fleets with more time if they encounter manufacturer delays in obtaining the engines, vehicles, or retrofits that they need for compliance. See manufacturer delay provisions in section 2449(e)(6) and Tier 3 and Tier 4 delay provisions in section 2449(e)(9).
 6. The regulation applies equally to all vehicles that operate in California, whether California-domiciled or based outside of the state. Exempting out-of-state companies from this regulation would undermine the effectiveness of the regulation and would be unfair to California companies wishing to compete with companies from outside the state. Also, it is important to note that the regulation does not mandate retrofits. If an out-of-state or Canadian mining contractor brings relatively new vehicles to California, they may comply with the fleet average requirements of the regulation without having to install retrofits.
 7. and 8. The regulation exempts low-use vehicles (vehicles that operate less than 100 hours in any particular reporting year (annually March 1 to the end of February)) from having to meet the regulations' performance requirements. Also, fleets that have three years of operating records may also identify a vehicle as low use if the average annual hours of operation over the last three years are less than 100 hours per year. However, such vehicles must still meet the labeling and reporting/recordkeeping requirements.
- In addition, the provisions in the regulation that permit fleets to utilize hours in their fleet average calculations will allow them to concentrate their compliance funds on relatively heavily used vehicles and keep some low use vehicles uncontrolled for longer periods of time.
9. Staff agrees that the regulation should recognize the benefits of using electric vehicles and equipment. As such, the regulation provides credit and incentives for use of electric engines in place of diesel engines by allowing electric vehicles that replace diesel vehicles to be counted in the fleet average. The regulation also provides double credit in the years 2010 through 2016 for electric vehicles

purchased on or after January 1, 2007. To ensure that the work of diesel vehicles is being replaced by electric vehicles, the regulation specifies criteria for demonstrating that an electric or alternative fuel vehicle replaces a diesel vehicle (it must serve the same purpose as a diesel vehicle, must be used outdoors, etc.). For electric vehicles that replace a diesel vehicle, the horsepower of the diesel vehicle replaced may be used as the horsepower of the electric vehicle.

The regulation also gives credit for electric equipment and electric portable or electric stationary systems that replace diesel vehicles. Specifically, mine fleet owners may apply to the Executive Officer to include electric portable or electric stationary systems, such as an electric conveyor system designed to replace off-road diesel vehicles at a mine, in their fleet average calculations. This provision in section 2449(d)(1)(C) allows the fleet to include the maximum power of the diesel vehicles that were replaced in its fleet average calculations of Target Rate, Diesel PM Index, and NOx Index, along with an Emission Factor of 0. In order to use this provision, all the following conditions must be met: 1) The owner must demonstrate that it replaced an off-road diesel fueled vehicle subject to this regulation on or after January 1, 2007, and 2) The system is not already counted toward the fleet average emission level requirements for large spark ignition engine fleets in title 13, CCR, section 2775.1 or for portable diesel engine fleets in title 17, CCR, section 93116.3.

10. We recognize that in some applications, VDECS may pose safety concerns. As such, we have structured the regulation never to require a VDECS if it cannot be safely installed or operated, or if use of the VDECS would conflict with occupational or mining health and safety requirements. Under section 2449(e)(8) of the regulation, a fleet owner may request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because it cannot be safely installed or operated in a particular vehicle application or because of a conflict with state or federal health and safety requirements. The requesting party would have to provide reports and findings of federal, state or local government agencies, independent testing laboratories, engine or equipment manufacturer studies, or other equally reliable source to support its request, unless the VDECS manufacturer has stated the system cannot safely and appropriately be installed on the vehicle in question. See also the responses related to VDECS safety in Chapter III-A-2 of this FSOR.

11. We acknowledge that there are a very limited number of underground mines currently in operation in California. According to the MSHA, there are three operating underground mines in California that use diesel engines, and all three are gold mines. Other underground mines in the state employ pneumatic or electric machinery.

It is important to note that the regulation affects a wide variety of types of vehicles, operations and industries, many of which individually are small. Although there are few underground mines, cumulatively such small sectors have

a noteworthy effect on air quality, and if we exempted every such small sector, we would be giving up significant emission reductions. Also, as the commenter notes, mining activity may grow in coming years based on market prices for gold and other minerals and on development of new technologies that make extraction more economical. The regulation will ensure that any growth in this industry is done in a way that minimizes potential impacts on air quality.

12. Improving the air quality inside the mine provides additional benefits compared to just controlling emissions at the mine's vents. By taking this approach, the regulation will improve the underground air quality for those working within the mine (thereby reducing risk due to their frequent and on-going direct exposure to diesel PM and other contaminants), as well as benefiting those outside the mine with overall less emissions coming from a mine's vents.

13. Reducing diesel emissions in non-residential and rural areas will improve air quality and reduce the risk of exposure to diesel PM for all Californian's, regardless of where they live. See the Chapter III-A-1 of this FSOR for further explanation of why emission reductions in rural areas are beneficial.

6)a)vii) Impact of Regulation on GSE Different

- 1. Comment:** The regulation is particularly burdensome and problematic as applied to diesel GSE due to its highly specialized nature and critical role in the safe and efficient functioning of the National Airspace System (and thus disproportionate importance to the California economy). The regulation will require our members to spend over \$100 million and replace or retrofit virtually every diesel unit of GSE in California. (ATA1)
- 2. Comment:** As the federal Aviation Administration (FAA) has confirmed, "reliable GSE equipment is... essential to safe and efficient use of navigable airspace." Even a short interruption or delay in a single flight caused by underperforming GSE will affect the timing and routing of other aircraft on the ground, resulting in, for example, delays in aircraft reaching the runway queue on time and consequent compression of the time between take-offs. Unlike many other off-road equipment applications to be addressed by the regulation, GSE functionality cannot be compromised to achieve other regulatory goals. A GSE vehicle that underperforms in the midst of a busy airport operation cannot simply be pulled aside and replaced by a virtually identical unit with minimal safety and economic impacts, as may typically be the case in many construction applications or other activities governed by the regulation. In some cases, an airline or airport may have only one of a particular type of specialized GSE vehicle. In any event, even if a backup unit exists, it is not acceptable to disrupt airport operations to allow an underperforming unit to be removed from the tarmac, while another unit is pulled from service elsewhere and driven across a busy airfield to take its place. There are approximately 200-300 different makes and models of GSE in operation at

airports in California today, performing very specialized functions. While extraordinary diverse, the total number of GSE in California is relatively small, accounting for approximately 1% of the equipment subject to the regulation. Within this 1% there are very small sub-niches of GSE that perform extraordinarily specialized functions at airports and for certain GSE types there may exist fewer than a handful of units even at a major airport (if not in the entire State). Thus, GSE represents a very small market for engine and vehicle manufacturers. However, given its critical role in the National Airspace System, GSE has disproportionate significance to the State and national economies. In the context of complying with air emission regulations, however structured, the addition of retrofits or use of any new engine technologies in GSE requires additional engineering, design, and development by airlines, [which] are often forced to seek to work together with OEMs. Integration of such technologies into GSE in a way that does not impede safe and efficient air transportation also requires substantial real-world testing and personnel training to ensure that modified or redesigned units are reliable, can perform the necessary functions safely and effectively in an airport setting, and can be successfully integrated into the overall aircraft service scheme. These additional steps are unique for GSE, and involve significant additional lead-time (typically at least 2-3 years), cost, uncertainty, and potential for operational disruptions. The end result of such efforts may be to demonstrate that a particular technology is simply not appropriate or feasible for a particular type of GSE. (POHLE)

Agency Response: We do not believe that GSE equipment should be allowed to emit NOx and PM at levels that are detrimental to human health and the environment. GSE equipment is subject to the regulation, and GSE fleets must meet the targets just like all the other off-road fleets in California. To the extent that commenter POHLE is arguing that GSE are preempted from regulation, see the responses in Chapter III-A-19 of this FSOR. For additional information on why emissions reductions are needed from all off-road vehicles, please see the responses in Chapter III-A-1 of this FSOR.

Additionally, we do not believe that GSE fleets will use VDECS as the primary strategy to reduce their PM emissions. Airline stakeholders told staff several times during the workshop process for the regulation that they prefer to comply without installing retrofits, and ARB understands that they will elect to replace many of their diesel vehicles with electric vehicles. The off-road regulation contains section 2449(d)(1)(A)3.b., which states that any electric vehicles added to a fleet between 2010 and 2016 will receive double credit (i.e., all electric vehicles added to the fleet will count as double the horsepower with PM and NOx emission factors of zero). This provision, which was added to the regulation at the request of the Air Transport Association (ATA), will allow GSE equipment to be replaced with electric vehicles, and potentially lower a GSE fleet's PM averages enough to avoid installing PM VDECS. The electric double credit

provision lasts through 2016, at which time Tier 4 vehicles will be available, allowing GSE fleets to upgrade to Tier 4 vehicles that do not require the installation of VDECS.

As discussed in the response in section III-A-2)a)ii) of Chapter III-A-2 of this FSOR, under the process in section 2449(e)(8) a VDECS that impairs the safe operation of the vehicle would not be considered a highest level VDECS. If all VDECS would impair the safe operation of the vehicle, then the vehicle is considered to have no highest level VDECS, and no VDECS must be installed. Also, the regulation gives fleet owners a choice as to which vehicles they retrofit first, so if retrofit installations are more challenging on some vehicles, fleet owners may choose to retrofit others first. ARB staff will be developing guidance during implementation of the regulation, which may address issues involving safety and availability of VDECS used for compliance.

We acknowledge that there are costs associated with the regulation that may be financially significant to fleet owners with affected vehicles. For a further discussion on the affordability of the regulation, see the responses in section III-A-3)a) in Chapter III-A-3 in this FSOR.

6)a)viii) Intentionally Left Blank

6)a)ix) Change Exemption from Vehicle to Engine

1. **Comment:** Text indicates vehicles less than 10 years old are exempt from BACT. Yet there is no exemption in this section for repowered equipment. It is the engine and not the vehicle that emits pollutants. Providing an exemption for vehicles less than 10 years old and no exemption for repowered equipment is a disincentive to repower, which is generally a lower cost option to new equipment purchase. Moreover, repowering is not cheap. Either text should be changed from “vehicles” to “engines” (preferably to simplify matters) or an exemption should be provided for vehicles that have been repowered with lower emission engines. Text indicates that engines in vehicles less than five years old are exempt. Text is unclear if the exemption applies to the engine or the vehicle. Again, it is the engine that emits, not the vehicle. The text “in vehicles” should be deleted. (CBIA)

Agency Response: We acknowledge that the regulation gives a guaranteed 10-year life to vehicles but not to engines used for repowering, and we disagree that this should be changed. We clarified in the First Notice of Public Availability of Modified Text and Availability of Additional Documents that the exemption is based on the vehicle’s date of manufacturer. We do not believe this provision should be changed. To give repowers a guaranteed life would sacrifice emission benefits from what we have estimated. In addition, purchasing a new vehicle represents a greater investment than purchasing a new engine and so warrants more protection.

Also, turnover is only required to the extent fleets do not meet the NOx fleet average and therefore has to comply with the BACT turnover requirements. There is no need to guarantee a life for Tier 3 repowers, because in most cases, the fleet average will naturally limit what has to be done. That is, Tier 3 repowers will naturally bring a fleet into compliance with the fleet average targets before subsequent turnover of the engines would be required.

If a fleet does not meet the fleet average and must consider the BACT, it will need to think carefully regarding the best, most cost-effective steps to take to comply – i.e., evaluate buying a new vehicle versus buying a used vehicle versus repowering an existing vehicle. As an example, a fleet is faced with a choice of a Tier 3 repower, or a used vehicle with an interim Tier 4 engine OEM installed. More progress towards the fleet average would be realized with the vehicle with the interim Tier 4 engine compared with the Tier 3. The fact that the operator does not get a guaranteed life on his repower should push them towards the newer vehicle, which would achieve greater emission reductions.

Similarly, the regulation exempts engines in vehicles less than five years old from retrofit requirements, and we disagree that this should be changed. We clarified in the First Notice of Public Availability of Modified Text and Availability of Additional Documents that the exemption is based on the vehicle's date of manufacturer.

6)a)x) Treat Waste Removal Services Differently

- 1. Comment:** Waste services should be treated differently. Today, most solid waste services are provided pursuant to rate-regulated service agreements between public agencies and private companies. The nature of these long-term contracts makes it extremely difficult to ensure that the industry is appropriately compensated for the costs of complying with expensive and long-term regulatory requirements that are adopted after the initial service contracts have been executed. (STODDARD)

Agency Response: We disagree. We recognize that the economic impacts of the regulation will vary among fleets. However, crafting differing requirements for fleets based on the structure of the contracts under which they work would have been difficult to accomplish and would have significantly added to the complexity of the regulation. The costs associated with compliance can be passed directly onto their customers via rate increases and environmental fees. Please refer to the responses in sections III-A-3)d)i)2) and III-A-3)f)vii) of this FSOR for a discussion of the costs associated with the regulation and how it will specifically affect waste management companies and their current contracts.

For an additional discussion on how the regulation affects different businesses, please see the response in section III-A-6)a)vi) of this FSOR.

6)b)i) Raise Low-use Threshold

- 1. Comment:** ARB should increase the threshold for a vehicle to be defined as low-use to over 100 hours per year. This threshold should be raised to 200 or 300 hours per year. (EUCA7) (AAWC2) (RJB2) (EDC-DOT) (ROBINSON)
- 2. Comment:** Allow foreign based power (e.g., equipment brought in from out of state) to be classified as low-use if it is operated in California no more than 180 days or 1,440 hours, as the 100 hour threshold poses a special burden on the railroad. (BNSF)
- 3. Comment:** ARB should increase the threshold for low-use vehicles in small fleets and municipalities in low-population counties to a number that would not significantly impact the emission reduction goals, but still allow additional exemptions. To provide additional relief to small business owners and low population counties, we ask the Board to consider increasing the threshold to minimally 200 hours, ideally to 300 hours. 100 hours represents only 12 and a half eight-hour working days out of a year. (RCRC) (RCRC3)
- 4. Comment:** We have a very large grader that's only needed less than one day a week. There's nobody that's in business in their right mind could retrofit and put an engine in that grader and only use it maybe one day a week. (ROBINSON)

Agency Response: As discussed in Section A of Chapter XII of the Technical Support Document, staff evaluated various possible thresholds for the low-use definition and chose 100 hours per year as the best threshold for making the rule as cost-effective as possible without foregoing appreciable emission reductions.

If the threshold for the low-use definition were set higher (such as at 200 hours per year), the rule would leave many vehicles uncontrolled and would achieve far less emission reductions, undermining the effectiveness of the regulation and compliance with NAAQS. As discussed in Section A of Chapter XII of the Technical Support Document, based on survey data from the 2005 ARB off-road equipment survey, over 20 percent of affected vehicles operate less than 200 hours per year, with around 11 percent operating between 100 and 200 hours per year. If the low-use threshold were set at 200 hours per year, in 2010, about 7 percent of the potential emission reductions would be foregone. By 2020, this would represent an even greater portion of the emissions from affected vehicles, as an estimated 9 to 11 percent of potential emission reductions would be foregone because higher use vehicles would be controlled by then.

During the development of the regulation, staff recognized the need to allow fleets to target their compliance actions on their highest use vehicles first, and structured the regulation such that, if they want, fleets may take advantage of the

hours of use of each vehicle in fleet average option. This allows fleets the flexibility to select the order in which they control their vehicles such that they may invest their compliance costs in more heavily used equipment first. For example, a fleet with the large grader mentioned in the comment above may choose to utilize the fleet average option that includes hours and clean up more frequently used vehicles preferentially instead of the grader. The more frequently used vehicles would then carry a greater weighting than the grader in the fleet's averages. This option may allow them to let the grader be used until the end of its normal life. Alternatively, the fleet with the large grader may choose to keep it but designate it as a low-use vehicle and use it less than 100 hours per year. Finally, renting vehicles for short periods of time provides another option. For example, the fleet with the large grader could retire the grader and instead rent a grader when it is needed.

6)b)i)1) Base Low-use on Total Fleet Use

- 1. Comment:** The exempted low-use vehicle approach is flawed. Low usage should be based on a blanket allowance for the total hp/hrs used by the fleet, not limited to a set hour use for each piece of equipment. On low-usage equipment, Delta may acquire 300 or more hours. This hardly relates to the potential 65 percent usage of equipment on any given year, which would total 1,200 to 1,400 hours (typical of large contractors in Northern California). A blanket allowance would permit contractors to maintain operations without resorting to "clock disconnecting" or other methods of manipulating the system. (DCCI)
- 2. Comment:** The definition for "low-use" is not fair, and doesn't work well. It also discriminates against contractors in northern California. We work a nine-month season in northern California. In southern California they work 12. A usage of a medium-sized contractor in northern California could be in the 12,00 to 1,500 hours a year. Down here it's 1,800 to 2,000. A hundred hours a year is not adequate for the small contractor. It won't work. And on an individual piece-by-piece basis it isn't going to work because I don't know what piece of my equipment is going to work 300 hours and which one's going to work 150 hours. And so I don't know which one to designate as small. What we need is a fleet average for our lower usage where we can multiply all the horsepower by the number of hours we use it. (DCCI2)

Agency Response: We recognize that, due to climate differences, construction vehicles in Southern California generally operate for a longer season and more hours per year than those in Northern California. However, staff does not agree with the commenter's suggestion of changing the definition of low-use in the regulation to utilize a blanket allowance. In order for a regulatory requirement to work, it needs to be feasible and enforceable, and as simple as possible. The commenter's suggestion raises a number of implementation challenges relative to staff's proposal. If a blanket allowance were used where low-use hours were

essentially shared among a number of vehicles in the fleet, it would require an increased number of hour meter readings to be completed, recorded, summed, and inspected by enforcement personnel. This in turn would not only make the requirement more complex and expensive for the fleet operator, but more difficult to enforce.

The regulation does recognize the need to allow usage to play a role in determining compliance with PM and NOx fleet averages. The regulation contains provisions for the use of hours in fleet average calculations that allow fleets the option of complying with an activity-weighted fleet average rather than a fleet average based solely on horsepower and engine emission factor. These provisions will allow fleets to focus their compliance strategies towards vehicles that are more heavily used. Such fleets may choose to keep a few older, dirtier vehicles that are used rarely and therefore do not count heavily in their hours-weighted fleet average. This strategy would serve the same purpose as the “blanket allowance” structure suggested by the commenter.

During the regulatory development process for the regulation, staff modified the low-use definition to provide fleets more flexibility based on comments received from stakeholders. For example, staff included a provision in the regulation that allows fleets that have three years of operating records to identify a vehicle as low use if the average annual hours of operation over the last three years are less than 100 hours per year. So even if a vehicle is used over 100 hours per year in one year, it may still qualify as low-use if on average over three years it has been used less than 100 hours per year. Also, it is important to note that any vehicle in the fleet that is operated in California less than 100 hours during the last reporting period may be classified as low-use. Therefore, the pieces of equipment classified as low-use may change each year if necessary. This increases the flexibility of the regulation, and addresses the concern of the commenter that fleets will not know which vehicle to designate as small.

Comments regarding why the low-use threshold was set at 100 hours per year are addressed response to III-A-6)b)i) in Chapter III-A-6 of this FSOR.

6)b)ii) More Flexibility for Big Companies with Low-Use Vehicles

- Comment:** Operators with lower-use machines should be given options such as retrofitting existing machines with Level 1 or Level 2 devices. If retrofitting with a Level 1 or a Level 2 device, the owner would have five years from the date of installation to: retrofit the machine with a Level 3 device, replace the machine with a new or newer compliant machine, or dispose of the machine. This would provide sufficient time for public agencies to develop and implement a compliance strategy. (GLATKY)

Agency Response: We disagree. The regulation already gives operators with lower-use machines several options. First, if lower-use machines operate less than 100 hours per year, they are defined as low-use and exempted from all

performance requirements. Second, fleet owners have the option of using the hours in fleet average provisions, which give greater weight to more heavily used vehicles. The hours in fleet average provisions allow fleets to concentrate their compliance dollars on the vehicles that are used more and emit more.

However, in all cases, the regulation only credits the installation of the highest level VDECS toward the PM BACT requirement. This provision is intended to achieve the greatest emission reductions at the greatest cost-effectiveness. Allowing lower-level VDECS to be installed would not likely achieve those objectives; in particular, emission reductions would likely be lost in the early, more critical years of the regulation as less effective emission reduction technologies were used. Please see the response in section III-A-6)d)viii) of this FSOR for a discussion of why we do not believe the regulation should give credit for installation of Level 1 devices, which reduce diesel PM by only 25 percent.

Finally, the regulation already provides credit for Level 2 devices in the fleet average; therefore a fleet could pursue a strategy of retrofitting with Level 2 in order to meet the fleet average targets in the early years of the regulation, and then subsequently replace these vehicles with new vehicles in later years. However, such a strategy assumes Level 2 devices are the highest level verified devices that can be safely installed on the fleet's vehicles.

6)b)iii) Revise Definition of Max Hp for Electric Vehicles

- 1. Comment:** The proposed definition of "Maximum power" (Max Hp) as applied to electric vehicles is unworkable and should be revised. The definition should be modified to allow the maximum horsepower for an electric-powered unit to be equal to the corresponding diesel unit performing similar activities within the fleet. This proposed definition of Max Hp is incompatible with electric vehicles, because SAE J1349 does not apply to electric vehicles and the electric vehicle motor power is determined from a curve and is not a unique value. This definition should be modified to allow the maximum Hp for an electric-powered unit to be equal to the corresponding diesel unit performing similar activities within the fleet. (ENDSLEY)
- 2. Comment:** While the regulation allows credit for electric equipment based on the hp of any diesel vehicle it replaced, it provides inadequate credit for new electric equipment that is added and does not replace an identifiable existing diesel vehicle. For such new electric vehicles, the regulation requires using the hp of the electric motor – a figure which is essentially meaningless, usually not readily available to the end-use, and not comparable to the hp ratings given internal combustion engines. The regulation should provide credit for all electric GSE based on the average hp for all diesel-fueled GSE in a given category or use other reasonable default values that assign an hp figure to electric that is similar to the hp rating of a comparable diesel vehicle. The regulation needs to provide

appropriate credit to fleet operators who install, or have already installed, electric equipment. (ATA1)

Agency Response: We recognize that the hp ratings of electric motors are not comparable to the hp ratings for internal combustion engines. As noted by commenter ATA1, the regulation as proposed in the Staff Report allowed a fleet owner to use the maximum power of the diesel vehicle replaced as the Max Hp for the electric vehicle that replaced it in the owner's fleet. In the First Notice of Public Availability of Modified Text and Availability of Additional Documents released on December 11, 2007, we added the following language for electric vehicles added to a fleet that do not replace a diesel vehicle in section 2449(d)(1)(A)3.a.: "For an electric vehicle added to the fleet, the fleet owner may apply to the Executive Officer to use the maximum power of a diesel vehicle that serves the same function and performs equivalent work to that of the electric vehicle. In making his or her determination, the Executive Officer will approve the use of the minimum Max Hp of a diesel vehicle that would be required to perform the same functions and equivalent work. If no request to the Executive Officer is received, the electric vehicle's own maximum power rating should be used."

6)b)iv)1) Raise Small Fleet Threshold

1. **Comment:** All fleets with 10,000 hp and under should be defined as small fleets. (PCCA) (VCE1)
2. **Comment:** The small fleet limit should be higher than 1,500 hp. (DCCI2) (FAUCHIER1) (DAVIES)
3. **Comment:** Your proposed rule has the small fleet interval set at 1,500 horsepower (hp) or less . A more reasonable limit would be 3,000 to 4,000 hp for a small fleet. (DCCI)
4. **Comment:** Your definition of what constitutes a “small fleet” is not at all in line with what really constitutes a small fleet. (TURNER)
5. **Comment:** We'd like to see the fleet definitions altered so that small fleets are 2500 horsepower or less. We think 2500 is far more representative of what would generally have been considered a small-sized business in the construction industry, much more so than the 1500 that the staff's proposing. (CBCC3) (CIAQC7)
6. **Comment:** A new ultra small fleet category should be added and be exempted from the regulations (family run business with 3 or less vehicles and the total horsepower does not exceed 300). (COX)

Agency Response: In the Staff Report, staff proposed to define small fleets as those up to 1,500 hp, medium fleets as those with 1,500 hp to 5,000 hp, and

large fleets as those with over 5,000 hp. After the Staff Report was released, many stakeholders commented that additional fleets should be defined as small, and at the July 26, 2007, Board Hearing, staff proposed to adjust the cutoff for small fleets upward to 2,500 hp.

Staff made available for public comment the upward adjustment of the small fleet size definition in the First Notice of availability of modified text. Included in that Notice was staff's estimate that changing the small fleet cutoff from 1,500 to 2,500 hp would result in approximately an additional 7 percent of fleets being defined as small. It would also result in a loss of only 1-2 percent of the regulation's NOx benefits, and almost no loss in PM benefits.

At that hearing, staff also recommended against raising the small fleet cutoff above 2,500 hp because to do so would sacrifice too many more emission reductions.

We did not propose creating an ultra small fleet category because we feel the special provisions for small fleets (5 more years, or until 2015, to begin complying with the regulation, as well as a complete exemption from the NOx requirements) provide enough relief for small fleets, and enough time for them to prepare to comply. Also, adding another fleet size category would add additional complexity to the regulation and would raise concerns from small fleets that do not meet the ultra-small fleet definition that it would be unfair for them to have to compete with ultra-small fleets.

6)b)iv)1a, 3a) Small Fleets Included in Captive Attainment Area Definition

1. Comment: Support CAPCOA's suggested amendment to the Small Fleet definition:

Small Fleet – A fleet with total maximum power of less than or equal to 1,500 hp that is owned by a small business or less than or equal to 1,500 hp that is owned by a local municipality, or a local municipality fleet in a low population county irrespective of total maximum power, and fleets with total maximum power less than or equal to 9,000 hp that are operated entirely within a single, low population, Captive Attainment Area county. (BERRYHILL) (BMM1) (BMM3) (TCCHAMBER) (COGDILL)

Agency Response: The regulation already includes special provisions meant to lessen the impact of the regulation on small fleets and those in captive attainment area counties. Fleets in captive attainment area counties are already completely exempt from the NOx requirements of the regulation. We do not support making the change suggested by the commenter because doing so would result in fewer and later PM emission reductions. Reducing diesel PM emissions is important even in rural areas, as discussed further in the Chapter III-A-1 of this FSOR. For an additional discussion on the small fleet definition, see the response in section III-A-6)b)iv)1) of this FSOR.

For a discussion regarding captive area attainment provisions, see the response in III-A-6)b)iv)3)b) of this FSOR.

6)b)iv)2) Remove Small Business from Small Fleet Definition

- 1. Comment:** Small business certification financial language should be removed from any fleet classification. (PCCA) (VCE1)
- 2. Comment:** The requirement to meet a “small business” definition should be dropped. The dollar volume of work performed is not a good measure of company size given the cost of materials and labor used for many construction jobs. (CIAQC7)

Agency Response: We agree. The requirement for a business to also be a small business in order to be defined as a small fleet was removed in the second Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released February 5, 2008.

6)b)iv)3a) See above.

6)b)iv)3b, 3c) Additional Counties in Captive Attainment Area Exemption

- 1. Comment:** We ask that you extend the captive attainment area to include Tuolumne County, which is nonattainment solely due to transported pollution from the Central Valley. This is supported by our Air Quality Control Board and our Assemblyman and our Senator as well. This would give us a few additional years to be able to prepare and comply with the rule. The concept of captive attainment areas in the regulations I feel has it backwards. The rural downwind counties who don't contribute any pollutants to extreme nonattainment areas should get the NOx exemption, not the upwind counties whose NOx emissions only add to the problem. Extend the definition of captive attainment areas to include those small rural counties as recommended by the California Air Pollution Control Officers Association (CAPCOA) in their comment letter. (BMM3) (BMM1)
- 2. Comment:** The Captive Attainment Area fleet provides no method for adding or deleting counties based upon future pollution considerations. (ARA2) (BCAQMD)
- 3. Comment:** ARB should consider eastern Nevada County as a “Captive Attainment Area” for ozone and exempt it from the NOx turnover requirement in the regulation. (NSAQMD)
- 4. Comment:** The "Captive Attainment Area Fleet" exemption as defined in Section 2449(c)(5), needs to include Santa Barbara as they are a NAAQS attainment area that also does not contribute to downwind transport.

During the development of our 2004 Clean Air Plan, my staff worked closely with ARB to determine the level of impact that Santa Barbara County has on air quality in the South Coast Air Quality Management District. The results of this study are summarized in a letter from the Air Resources Board dated August 25, 2004 determining that our contributions are "inconsequential." The findings of the study were incorporated in our 2004 Clean Air Plan and forwarded to ARB.

(SBCAPCD)

5. **Comment:** The concept of Captive Attainment Area Fleets should be extended to rural areas that are classified as ozone non-attainment as a result of transport. (SVBAPCC) (BMM2) (BERRYHILL) (BCAQMD)
6. **Comment:** CAPCOA, among others, supports the concept of "Captive Attainment Areas" that exempts all fleets from the NOx standards in counties that are in attainment for ozone. ARB should include counties that are classified non-attainment due to transport, such as Tuolumne, as captive attainment areas. Our county is classified as non-attainment for ozone; however it is not due to local emission contributions, but due to emissions blown into our county from other places (e.g., San Joaquin Valley). Our local emissions are small. The reductions from the areas with the worst air will fix this problem, without significantly burdening our businesses with additional costs. (TCCHAMBER)
7. **Comment:** An important component of the regulation is the ARB's treatment of "Captive Area Attainment Fleets" and their exclusion from the fleet average NOx requirement. Those fleets in small, rural counties located downwind from larger, more urbanized counties are not exempt from the NOx requirement, even though these downwind rural counties are classified as non-attainment solely as a result of transport from larger urban counties. I urge you to extend the concept of the Captive Area Attainment Fleets to these rural counties that are classified as ozone-attainment due to transported emissions. (COGDILL)
8. **Comment:** ARB should extend the captive attainment area provision to counties that are classified as non-attainment strictly due to transport (e.g., Tuolumne). There are six or seven counties that fall under that classification. Meeting NOx reductions is a considerable financial impact to our small to medium fleets which will have a negative economic impact to our rural counties. Compliance with the NOx requirements of the proposed regulations in those counties will not significantly reduce the emissions and will not bring those counties into attainment, whether or not you have the regulation in place. This request is supported by certain local air districts and CAPCOA. (RCRC3) (BERRYHILL) (RCRC)

9. Comment: Rural areas classified as ozone nonattainment as a result of transported pollution should be added to the list of counties where Captive Attainment Area fleets can operate. Some additional consideration is needed in some of the rural areas of the state, and can be achieved without compromising the overall effectiveness of the regulation. Some of the smaller, rural districts remain concerned about the challenges faced by small fleets, both public and private, in meeting the requirements of this regulation. We understand that the local contribution to non-attainment in these areas is so small that the local emissions reductions are not needed to show attainment. (CAPCOA)

10. Comment: Our main concern with the proposed control measure is that rural counties will face economic hardships due to the costs that will be incurred in complying with the NOx reduction provisions of this regulation. Requiring the larger urban counties to comply with this proposed regulation commensurate with their contribution of emissions will sufficiently reduce the lion's share of NOx and PM emissions that are generated. Adding Tuolumne, Mariposa, Calaveras and Amador counties to the Captive Attainment Area Fleet definition and exempting these counties from the NOx Fleet Average and turnover requirements is consistent with the California Clean Air Act and California Health and Safety Code Section 39610, which is intended to place the burden of reducing emissions on those upwind air districts that cause or contribute to ozone violations in the downwind districts. (TCBS)

Agency Response: Staff disagrees with extending the "Captive Attainment Area Fleet" definition to include areas that are classified as ozone non-attainment as a result of transport. These areas have been designated by the U.S. EPA as violating the federal 8-hour ozone standard, and the air quality in some of these areas is degrading, potentially warranting a future redesignation as severe non-attainment for the federal ozone standard. Because of this, staff believes that actions must be taken within these areas to meet this standard, and at the regulation will provide important emission reductions towards that end. There are five complete counties that are impacted by overwhelming transport emissions: Amador, Calaveras, Mariposa, Nevada, and Tuolumne. There are also two partial counties that meet the criteria (Riverside and Kern). Local NOx contributions add to the severity of the ozone problem.

We agree with commenter SBCAPCD that Santa Barbara County should be added as a captive attainment area county. This decision is based on the fact that Santa Barbara County attains all federal ambient air quality standards and that its impact on the South Coast Air Basin is "inconsequential". The addition of Santa Barbara County to the Captive Attainment Area Fleet definition in section 2449(c), as modified in the First Notice of Public Availability of Modified Text and Availability of Additional Documents, released on December 11, 2007, addresses this concern. However, staff disagrees with providing a method for adding or

deleting counties from the “Captive Attainment Area Fleet” definition based upon future pollution considerations. This would decrease the clarity of the regulation and make the regulation more complex and unpredictable. In particular, this would create significant uncertainty among fleets if the attainment status of a county changed, thereby changing the regulatory requirements for fleets in that county. This could mean that a fleet, fully complying one year, could find itself out of compliance the next year if the attainment status of the county changed. As such, staff believes that it is more appropriate to delineate the counties that are included in the “Captive Attainment Area Fleet” definition up front so that there is no future ambiguity regarding this provision.

Please see Chapter III-A-1 of this FSOR for a further discussion of why emissions reductions are needed in rural areas, as mentioned by commenter CAPCOA.

Lastly, comments regarding regulatory costs and revision of the small fleet definition are addressed in the sections pertaining to those topics in Chapter III-A-3 and Chapter III-A-6 of this FSOR.

6)b)iv)3d) Definition of Captive Attainment Area

- 1. Comment:** The last sentence in the captive attainment area fleet requirement says that your entire fleet has to be operated in that county. We have all this big equipment that's not easily moved - 50 ton trucks - large excavators. We don't want to be punished because we have operations in other counties, we'd like to see you delete that last sentence. (REI2)

Agency Response: Staff agrees that the definition of captive attainment area fleet should be modified to allow a fleet portion that is operating solely in a captive attainment area to comply with the regulation separately from other portions of the same fleet that do not operate solely in a captive attainment area. Therefore, in the third Notice of Public Availability of Modified Text and Availability of Additional Documents released on March 5, 2008, staff modified the language in this section to clarify that a fleet may have some fleet portions that meet the definition of captive attainment area fleet and some that do not. Fleet portions may only comply and report separately if they are under the control of different responsible officials because they are part of different subsidiaries, divisions, or other organizational structures of a company or agency.

This means that fleets that have some vehicles that do not operate outside the counties listed in the “Captive Attainment Area Fleet” definition may report those vehicles as a fleet portion and avoid complying with the NOx performance requirements of the regulation for those vehicles. For example, if a company with more than 5,000 total horsepower operates a landfill in Alpine County and also operates vehicles in Sacramento County, the company could choose to report the vehicles that are captive to Alpine County as a fleet portion, and those

vehicles would not be subject to the NOx performance requirements of the regulation (they would be subject to the PM performance requirements).

However, the vehicles that are operated in Sacramento County would have to meet both the NOx and PM requirements of the regulation. In this example, both fleet portions would have to meet the appropriate performance requirements beginning in 2010 (the first compliance date for large fleets).

Once a fleet begins to comply and report separately as fleet portions, the fleet portions must continue to comply and report separately, and the fleet portions must meet the adding vehicle requirements in the regulation just as if they were separate fleets. This means that fleets that are utilizing this provision and reporting fleet portions separately may not be able to freely swap vehicles back and forth between fleet portions.

6)b)iv)4, 5, 7, 14) Medium/Large Fleet Thresholds

- 1. Comment:** We have a small family-size business. We have 20 machines, but they're all twin engine scrapers. We have a total of 19,000 horsepower. So, therefore, we're lumped into the group of large, and I don't really think that's fair. (CER2)
- 2. Comment:** The sizing of medium and large fleets should be reconsidered. I'm a contractor that qualifies as a medium – but almost as a large (30 – 40 hp away), so by buying one piece of equipment would qualify me as a large contractor – and I'm not and could not comply I'm sure. I consider myself a small contractor – please raise the hp limits. (DAVIES)
- 3. Comment:** The middle size fleet category should be larger. (FAUCHIER1)
- 4. Comment:** Alter the fleet definitions so that large fleets are those over 10,000 hp. This limits would match the actual company/industry sizes better than the 5,000 hp cutoff proposed by staff. (CIAQC7) (CBCC3)
- 5. Comment:** The cutoff for a large fleet should be 20,000 hp, not 5,000 hp. (PCCA) (VCE1)
- 6. Comment:** The tax base in the state of California comes basically from the small community I think you need to take another look at the medium limits because the major tax base comes from the small contractors. That's the major employer. You could say that if we lose a few small firms, construction products will still be sold. But that's not true. The large companies do not pay this sales tax. The reason is, is they don't sell the material, they manufacture it for themselves and it goes to the customer. It's the small contractor and the medium contractor that buys this material

from the large contractors and then pays the sales tax. So when you take out one small business with 20 employees, you've taken \$320,000 in sales taxes that go to the state of California out of the picture. And I don't think that's wise. (DCCI3)

7. **Comment:** Your proposed rule has the small fleet interval set at 1,500 horsepower (hp) or less and the medium fleet interval set at 1,500 to 20,000 hp. This is a disproportionate interval. The regulation places our company (with 2,014 hp) in the same category as a rental company with 80 pieces of equipment with 19,000 hp. (DCCI)
8. **Comment:** Contractors need a level playing field when bidding jobs, so the regulation should apply equally to all fleet sizes. This would allow fleets of all sizes to pass the burdens on to their customers at the same time. (CALPASC1) (SUKUT3)
9. **Comment:** The regulation will give an advantage to small companies and out-of-state businesses that will not be subject to the same strict standards as larger, in-state firms. Therefore, under proposed regulations, small and out-of-state businesses will be able to compete for jobs at a far lower price. (CAR)
10. **Comment:** It is very important that this regulation treat different fleet sizes equitably because they compete against each other in an open-bid environment. (GC2)
11. **Comment:** Do not have compliance distinctions by fleet size. This regulation does not provide a level playing field. Large fleets have to comply five years before other companies. Large fleets will not be able to pass on compliance costs to their customers because small fleets will be able to underbid them. (NWS3)
12. **Comment:** Medium fleets have an unfair competitive advantage over large fleets for three years. My large fleet competes directly with medium fleets. Besides having access to Moyer funds, the medium fleet costs are at least three percent lower during these years, when our costs of compliance are the highest. This means that when we need the profits the most to pay for compliance, we will be placed at a cost disadvantage. (RTC)
13. **Comment:** From the staff's rules here, our 15 pieces of equipment, of which I always thought we were a small business, actually makes us a large fleet because we do operate in a quarry style situation, so we need to move large quantities of material in a short amount of time. So our 15 pieces of equipment put us over the 5,000 horsepower limit. Having the

cutoff for large fleet definition at 5,000 horsepower really puts us in a bad place. (CLOUD)

Agency Response: Staff designed the regulation to create as level a playing field as possible for affected fleets, while still recognizing that smaller fleets are likely to face greater challenges in complying with the regulation than larger fleets. Because of these greater challenges, we proposed different requirements for fleets of different sizes. As discussed in Chapter XII of the Technical Support Document, the majority of fleets are small fleets (i.e., fleets with very few vehicles), but the majority of affected vehicles are owned by large fleets (i.e., fleets with many vehicles). Only thirteen percent of fleets have total maximum power over 5,000 hp, but these very large fleets have over two thirds of the total hp of affected vehicles.

The discussion below addresses the following topics:

- Why we propose differing requirements for different size fleets;
- What horsepower interval the proposed medium and large definitions span;
- Why we set the medium fleet threshold at 5,000 hp; and
- How the regulation is designed to not give unfair advantages to out-of-state businesses.

Differing Requirements for Different Fleet Sizes

Staff gave medium fleets three more years to comply than large fleets. Staff felt this would give medium fleets an extra opportunity to apply for incentive funds to help fund compliance with the regulation. ARB staff is proposing earlier compliance dates for larger fleets than for smaller fleets for the following reasons: First, ARB staff recognizes that the largest fleets would have greater flexibility in prioritizing changes to their fleet for the cheapest cost, generally have more financial resources available, and would likely be better situated to understand how to comply with the rule. The largest fleets are, in general, large companies or government agencies that are likely to have environmental specialists on staff. Small and medium fleets may be smaller operations, for whom learning about and understanding the rule may be a bigger challenge.

Second, larger fleets are more likely to be able to absorb the cost of the regulation, because the largest fleets have economies of scale and access to financing that the smaller companies cannot duplicate.

Finally, educating a smaller number of stakeholders and enforcing the rule for the relatively few largest fleets would provide substantial air quality benefits and allow more time to address enforcement issues and to expand education and enforcement to the much more numerous smaller fleets.

Staff is sensitive to the fact that the regulation will impose significant costs on fleets and believes that the special provisions for smaller fleets will lessen the chance that the regulation will put fleets out of business. Thus, staff believes that having varying requirements for fleets of various sizes will decrease the chance that the regulation will decrease tax revenues from affected businesses. Staff is thus not proposing to revise the medium and large fleet size definitions.

Horsepower Interval

In the Staff Report, staff proposed to define small fleets as those up to 1,500 hp, medium 1,500 hp to 5,000 hp, and large those with over 5,000 hp. In earlier proposals presented at workshops, staff had proposed that large fleets be those over 20,000 hp. (It was this 20,000 hp definition of large fleet with which commenter DCCI was concerned.) After the Staff Report was released, many stakeholders commented that additional fleets should be defined as small, and staff agreed to adjust the cutoff for small fleets up to 2,500 hp. This means that the horsepower interval for small fleets (up to 2,500 hp) is now identical to that for medium fleets (2,500 to 5,000 hp). The response to comment 6b(iv)1) in this FSOR addresses why staff believes the small fleet threshold should remain at 2,500 hp and not be raised higher.

Setting the Medium Fleet Threshold at 5,000 hp

We do not support raising the threshold between medium and large fleets because to do so would forego too many emissions reductions. As stated above, only thirteen percent of fleets have total maximum power over 5,000 hp, but these fleets have over two thirds of the total hp of affected vehicles and therefore are responsible for over two thirds of the emissions.

As previously stated, staff proposed an earlier initial compliance deadline for the largest fleets because staff believes the largest fleets have the resources to understand and comply rapidly with the regulation. Additionally, with their economies of scale, greater revenue streams, and greater access to financing, are more likely to be able to absorb or pass through the cost of the regulation without major disruption. Furthermore, the largest fleets would have greater flexibility in prioritizing changes to their fleet to find their own most cost-effective way to comply. That is, larger fleets may be able to select their easiest, lowest cost vehicles to clean up in the early years, thereby giving themselves additional time to find solutions for their more expensive or difficult to control vehicles. It allows larger fleets to make decisions concerning which vehicles they plan to keep for a long time versus those that are not worth repowering or retrofitting because they would be turned over soon. Fleets with fewer vehicles may not have this opportunity.

According to Chapter IV of the Staff Report, enforcing the regulation early in the implementation process for just the relatively few largest fleets would present

less of a challenge than enforcing the regulation for the very numerous smallest fleets. In these first years of implementation, ARB inspectors would have the opportunity to better learn the industry and observe common violations.

Staff recognizes that wherever the cutoff between large and medium fleet is set, some fleets just below the cutoff will benefit, and some just above the cutoff will face a challenge. Fleets just above the cutoff may at times be competing with fleets that are below the cutoff and therefore are subject to less strict requirements. In addition, fleets just below the cutoff also will face a disincentive of growing beyond the cutoff because doing so would subject them to stricter requirements. Such fleets may choose to rent additional vehicles rather than purchase a vehicle that would put them over the large fleet cutoff. Overall, however, staff felt the advantages of granting more time to medium fleets outweighed the disadvantages of this approach.

Further discussion of the affordability of the regulation is included in Chapter III-A-3 of this FSOR. The use of incentive funds to comply with the regulation is addressed in the responses in section III-A-6e of this FSOR. Further discussion of the ability for larger fleets to compete in the market, under the regulation, are discussed in the response to comment III-A-6c)iii) of this FSOR. The small fleet threshold is discussed in more detail in the response to comment 6b)iv)1 in Chapter 6 in the FSOR.

Out-of-State Fleet Requirements

Staff also agrees that there should not be an unfair advantage for out-of-state businesses. As discussed in Chapter IV of the Staff Report, the regulation would apply to any affected vehicles being operated in California, whether they belong to government agencies, companies based inside California, or companies based outside the state. If they maintain fleets in California, out-of-state companies must meet the fleet requirements and abide by the idling limits just like any other fleet. Out-of-state companies that bring affected vehicles to California would have to report and label the vehicles. Vehicles brought into California must be reported to ARB within 30 days. If the vehicle does not have an EIN, ARB would assign one. The owner has 30 days upon receipt of the EIN to label the vehicle. If a vehicle brought in from out-of-state is used less than 100 hours per year in California, it would qualify as low-use. However, if an owner wants to claim a vehicle that is used both inside and outside California as low-use, the owner would have to submit a log to ARB showing the date and hour meter reading upon entry to California and the date and hour meter reading upon exit. Out-of-state companies that bring vehicles to California for the first time after March 1, 2009, must meet the fleet average requirements within three months of bringing vehicles to California. Such out-of-state fleets do not have the option of complying with the BACT mandatory retrofit and turnover requirements.

6)b)iv)6) Section intentionally left blank.

6)b)iv)7) See above.

6)b)iv)8) Feasibility Should Be Defined

1. **Comment:** Where a fleet average target is not met, the proposed regulation requires retrofit where “feasible”. However, feasibility is not clearly defined. With enough time and money, almost anything can be done. Some type of cost cap on a \$/hp basis should be included that defines feasible/infeasible and accounts for the ability for companies to absorb these costs. (CBIA)

Agency Response: Staff does not believe that a cost cap, as proposed by the commenter, is necessary to define feasibility. Under the regulation, the Executive Officer will determine the feasibility of retrofits by evaluating the availability of the devices, and whether or not they may be installed safely. In the first instance, availability is determined by whether an aftermarket diesel emission control strategy has been verified by ARB for a particular engine pursuant to the verification program established at title 13, CCR, sections 2700 et seq. Availability is also subject to whether the device can be applied to a particular vehicle or piece of equipment, and, if so whether the device is reasonably available for sale in the marketplace and can be safely installed. If a retrofit is not available or safe, the regulation does not require its installation.

The complexity associated with determining what costs should or should not be included in a retrofit for each vehicle, documenting those costs, and calculating those costs would be unworkable and unenforceable. Because of the ways a cost cap could be misused, placing a cap on the cost would likely significantly reduce the emission reduction benefits of the regulation.

Please see also the response in section III-A-6)k)vii)12) regarding why we do not believe a cost cap is appropriate.

6)b)iv)9) Revise Emergency Vehicle Definition

1. **Comment:** We strongly encourage that emergency vehicles under this regulation be clarified further in the regulation language or made consistent with the definition of “Authorized Emergency Vehicle” in the California Vehicle code §165. This definition is consistent with the one adopted by the Board for use in the ARB’s Fleet Rule for Public Agencies and Utilities. (LACITY)

Agency Response: We disagree. The definition of emergency vehicles used in California Vehicle code §165 is not appropriate for the off-road regulation because it would not be applicable to many of the vehicles covered by the regulation. This definition applies to publically owned vehicles used by local,

state, and federal government entities, and to those vehicles that can be granted an emergency vehicle permit by the Commission of the California Highway Patrol. These emergency vehicle permits are given to a limited variety of vehicles, most of which are also on-road and publically owned. Staff chose to use a broader definition of emergency vehicles in the regulation to allow this designation to be given to privately owned off-road vehicles that are needed to help alleviate an immediate threat to public health or safety. For example, privately owned vehicles brought to California to help respond to an earthquake or fire are exempt under the regulation's definition, but would not be exempt if the definition of Authorized Emergency Vehicle from the California vehicle code were used.

6)b)iv)10) Hp Rating to Use

1. **Comment:** The owner will have to recover information from the nameplate, such as family. If the Method J1349 rating or literature rating is different from the nameplate rating, which rating should be used. (ARA2)

Agency Response: For a consistent interpretation of maximum power, the owner should use either the SAE Method J1349 or ISO Method 9249 power rating if available rather than the nameplate rating. Should the SAE or ISO power rating not be available, the owner may use the nameplate rating or manufacturer's sales or service literature.

As stated in 2449(c)35 of the second 15-day notice, the definition of maximum now reads as follows.

Maximum power (Max Hp) means the engine's net horsepower or net flywheel power certified to Society of Automotive Engineers (SAE) Method J1349 or International Organization for Standardization (ISO) Method 9249.. If the engine's net horsepower or net flywheel power certified to SAE Method J1349 or ISO Method 9249 is not readily available, another net horsepower or net flywheel power from the manufacturer's sales and service literature or horsepower from the engine label may be used.

6)b)iv)11) Define "Same Hp"

1. **Comment:** What is the meaning of "same horsepower" in the context of the electric and alternative fuel vehicle comparison (2449(d)(10)(C)(IV))? If a 2010 diesel engine is rated at 400 hp and an alternative fuel engine is rated at 395 hp, are these the "same hp"? (ARA2)

Agency Response: The current regulatory language from section 2449(d)(1)(A)1.d. is as follows:

If the vehicle is an alternative fuel vehicle, the owner must demonstrate that it is certified to a NOx standard less than or equal to the Tier 1 NOx standard for the same horsepower in title 13, CCR, section 2423(b)(1)(A) and is less than or equal to the NOx emissions of a diesel engine of the same model year and horsepower.

For example, if an engine in an alternative fuel vehicle is 395 hp, model year (MY) 2007, first go to Table 1a in section 2423(b)(1)(A), look up the Tier 1 diesel NOx standard for 395 hp, and ensure that the alternative fuel vehicle's NOx standard is less than or equal to the Tier 1 NOx standard for an engine with 295 hp. Then, go to Table 1a in section 2423(b)(1)(A), look up the diesel NOx standard for 395 hp for MY 2007, and ensure that the alternative fuel vehicle's NOx standard is also less than or equal to that. Table 1a is for Tier 1, 2, and 3 engines; table 1b is for Tier 4 engines only.

6)b)iv)12) This section was left intentionally blank

6)b)iv)13) Classify DoD fleets as Medium Fleets

1. **Comment:** Classify DoD fleets as medium size, or according to on-site horsepower, not statewide fleet size which places all DoD fleets in the large fleet category. It is confusing why fleets owned by the United States are designated as large. Previously there was a designation as medium sized fleets. We have lots of vehicles and we have lots of federal agencies. At least from the military perspective, we have many bases which are very small and in very remote parts of the state. For the most part, each military installation does fleet management on its own.

However, there are some regional components. Budgeting for federal agencies is somewhat limited in that it takes us, for large expenditures such as this, five to seven years of a budgeting process. Putting us back in the medium category would give us more time to meet the budgeting deadlines that we have internally. We would also be willing to work with staff to take a look at which, if any, installations we have that exceed the threshold requirements that would categorize us as a large fleet, and that those would meet the large fleet deadlines. However, really small bases should be given additional time to reach compliance because they are in areas that have a low population that will have minimum air impacts. Low-population county municipalities are treated in that way now, and federal facilities in low-population counties should be treated the same way.
(JUNGREIS)

Agency Response: When staff released a draft proposal for the series of workshops conducted in December 2006, we had defined fleet size somewhat differently than in the adopted regulation. In that proposal, we had proposed a large fleet category with a first compliance date of March 1, 2009, meaning that large fleets would have needed to start taking action to reduce emissions by

March 1, 2009. In addition, we had proposed that medium fleets have an initial compliance date of March 1, 2010. In that December 2006 proposal, we also proposed that federal and state fleets be considered medium fleets, but only because we were aware (due to their relatively long budgeting process) that they would have difficulty meeting a compliance date of March 1, 2009. We were aware of this because we had received several comments previously on the timing and ability of government fleets to secure funding through their budget and approval process. Therefore, we allowed decided to allow fleets of the State of California and the federal government to meet a first compliance date in 2010.

In the adopted regulation, we removed the March 1, 2009, compliance date, and established the first compliance date in 2010 for the largest fleets. Therefore, the need for the one year delay for fleets of the State of California and the federal government no longer existed because the timing of the first compliance date for large fleets was now consistent with the budget process of both entities. Therefore, there is no need to redefine federal government fleets as medium fleets because the additional year has been provided to them in the adopted regulation.

Also, we did not extend the provisions for low-population county municipalities to military installations because we do not believe the Department of Defense faces the same funding challenges as municipalities in rural, low-population areas. We included the low-population county provisions in recognition of the unique budget circumstances municipalities in areas with a very small tax base face. However, it is important to note, that military bases that are captive to attainment areas can utilize the captive attainment area provisions just like any other fleet portion in such an area. See also the response to Comment III-A-6b)iv)3d) in this FSOR for further discussion of these provisions.

Finally, there are many fleets, besides state or federal government fleets that have operations in both urban and rural areas. The approach in the regulation is to define a fleet's size based on all the total horsepower it operates in the state. The federal government is being treated no differently than the State of California or a private company that has operations throughout the state, in that under the regulation its total horsepower is combined to determine fleet size.

6)b)iv)14) See above.

6)b)v) Define “Years Old”

1. **Comment:** In this regulation the term “years old” is used and there is no definition for it. It could be understood to relate to the model year, purchase date, or in-service date. (ARA2)

Agency Response: To keep the regulatory language brief and as simple as possible, staff did not define commonly used terms, like “years old.” Staff will

provide clarification on such terms if necessary in the informal guidance materials developed during implementation.

However, along these lines, in the First Notice of Public Availability of Modified Text and Availability of Additional Documents released on December 10, 2007, staff further clarified the regulation to indicate that the exemption from the turnover requirements for vehicles less than 10 years old is based on date of manufacture, not date of first sale. This section (2449.1(a)(2)(A)4.a.) now reads as follows:

A vehicle is exempt from the turnover requirements of section 2449.1(a)(2)(A)1. if all vehicles in the fleet that do not qualify for an exemption under this section have been turned over and the vehicle meets one of the following conditions criteria below:

- a. On the compliance date, the vehicle is less than 10 years old from the date of manufacture...*

In the most recent modifications, staff has further clarified the regulation to indicate that the exemption for vehicles less than 5 years old from retrofit requirements is based on date of manufacture, not date of first sale. This section (2449.2(a)(2)(A)4.a.)) now reads as follows:

A vehicle is exempt from the retrofit requirements in section 2449.2(a)(2)(A)1. if all vehicles in the fleet that do not qualify for an exemption under the following conditions have been retrofitted, and the vehicle meets one of the following conditions:

- a. On the date of compliance, the vehicle is less than 5 years old from the vehicle's date of manufacture...*

6)b)vi) Nonprofit Training Centers

- 1. Comment:** ARB should include nonprofit educational associations under Tax Code 501(a), 501(c)(3), 501(c)(5), and 501(c)(6) in the definition of non-profit training center. (OE5) (CALPASC4)

Agency Response: Staff agrees and made this modification as part of the first Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released on December 11, 2007. The definition of non-profit training center now includes any entity that operates a program for training in the use of off-road vehicles and qualifies as a non profit or not for profit organization under title 26 Internal Revenue Code, and all non-profit training centers under Tax Code sections 501(a), (c)(3), (c)(5), or (c)(6).

6)b)vii) Snow Removal Hours

- 1. Comment:** Include a provision that public fleets do not need to count hours used during snow removal operations when determining low-use

status of a vehicle. Vehicles used solely for emergency operations are exempt from the performance requirements of the proposed regulation and there is a provision that hours used for emergency operations are not counted when determining low-use status.

Dedicated snow removal vehicles are exempt from the performance requirements, but the hours used for snow removal operations are not counted when determining low-use status. Snow removal operations are also a public safety service, not only to the traveling public, but also for emergency vehicle access. We request that public agency vehicles used for any other purpose in addition to snow removal, the hours used as snow removal be exempted from the total mileage for determining low-use status. This provision was included in the Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies. (RCRC) (RCRC3)

Agency Response: Recognizing that snow removal is a public safety service, ARB staff exempted vehicles and equipment used solely for (dedicated to) snow removal from the performance requirements in sections 2449(d), 2449.1(a), 2449.2(a) and 2449.3(d). These vehicles, however, must still be labeled and reported in accordance with sections 2449(f) and (g). Additionally, dedicated snow removal vehicles need not be included when calculating fleet average indices or target rates, when determining fleet size, or when calculating the required horsepower for the BACT turnover and retrofit requirements in sections 2449.1(a)(2) and 2449.2(a)(2). Publicly owned vehicles used exclusively to support snow removal operations (such as a loader without a special snow removal attachment) but which do not meet the dedicated snow removal vehicle definition, are also exempt from the performance requirements in sections 2449(d), 2449.1(a), 2449.2(a) and 2449.3(d) and must be labeled and reported in accordance with sections 2449(f) and (g).

We do not support the commenter's request to not count a non-dedicated snow removal vehicle's use in removing snow in calculating the vehicle's status as a low use vehicle. First, we do not believe that snow removal meets the regulations definition of an emergency. Snow removal is, in general a routine operation that may have some public health and safety implications, but it is often not an emergency operation needed to meet an immediate threat to public health and safety. Second, to the extent that some snow removal operations can be classified as an emergency, there is no practical way for ARB to verify the actual time used in snow removal emergency operations. The vehicle's hour meter would indicate only the total hours used but would not be able to break out the time used in "emergency" snow removal operations and it would be impossible for an inspector to verify the hours claimed by the fleet.

6)b)viii) Need for Regulation in Rural Areas

- 1. Comment:** The proposal places restrictions on small population rural areas within the boundaries of counties that contain clusters of large populations in the other areas of those counties. We are located in the farthest north location of Sonoma County, which is very sparsely populated. Yet with the total population of Sonoma County, it appears that we do not qualify, and will need to seek funds for purchasing equipment to meet the proposed regulation. We are a water company in an area that still allows rural open burning due to its remoteness and light population density. To the immediate North is Mendocino County, and at last look with only 95,000 population in the total county, that county is not apparently subject to the same requirements of our location. So how does a water company that is governed by the Public Utilities Commission ask for rate increases for such expenditures that will be used for servicing the water company operations? I can see the need for the regulation in the populated areas, but not in rural areas. (WC)

Agency Response: The regulation contains special provisions for low-population county municipalities in recognition of the special challenges faced by municipalities in rural areas. Low-population counties are those with population less than 125,000. The regulation also exempts fleets captive to attainment areas if they also are not upwind contributors to downwind ozone exceedances from the NOx provisions of the regulation.

However, due to its population and attainment status, Sonoma County, where the commenter resides, does not qualify for either of these provisions. In year 2000, it had population of 458,614, which is higher than the low-population threshold of 125,000. The Southern portion of Sonoma County is classified as non-attainment for the federal 8-hour ozone standard. It attains or is classified for all other national ambient air quality standards. The Southern portion of Sonoma County is in the San Francisco Bay Area Air Basin, and the Northern portion is in the North Coast Air Basin. The San Francisco Bay Area Air Basin is a member of an upwind transport basin to a downwind nonattainment basin.

We believe reducing emissions even in rural areas will be beneficial for air quality for three reasons. First, reducing diesel PM emissions in rural areas is beneficial for the people in the rural areas because diesel PM is toxic. Second, some rural areas such as Sonoma County are out of attainment with the ozone and PM2.5 standards, and NOx reductions in these areas can benefit the local area by lowering local ozone and PM2.5 levels. Third, diesel PM and NOx both can be transported from rural to more densely populated urban areas downwind. See also the first response in Chapter III-A-1 of this FSOR for further explanation of why emission reductions in rural areas are beneficial.

6)b)ix) Define Method of Rounding

1. Comment: There are many methods of rounding. The most common are conventional and round to even. Excel seems to use conventional rounding. ASTM E29-90 requires “round to even” or “unbiased rounding”. EPA and many units of California government specify ASTM E29-90 in regulatory language. Below is a comparison of these two methods for a hypothetical case.

- Assume the weighted PM target is .459
- By conventional rounding the PM target is .46
- By Round to Even the PM target is .46
- Assume the weighted Fleet PM emission is 4.65
- By conventional rounding the PM emission is 0.47. Note that 5 is exactly midway and therefore rounding up always biases the result upwards.
- By round to even, the PM emission is rounded down to 0.46 (Had the second decimal place been odd, the rounding would have been up. The method does not always favor a pass in the comparison.)

Thus, with conventional rounding used by Excel, the fleet fails, but by E29-90, the fleet passes. This calculation example shows that a non-unique conclusion is possible. ARA strongly recommends that the ASTM29-90 method be specified. (ARA2)

Agency Response: We disagree that the “round to even” method should be used to determine compliance with the regulation for the reasons discussed below.

First, the “round to even” method could potentially decrease the stringency of the regulation for some fleets, and could therefore reduce emissions reduction benefits.

Second, the round to even method is unfamiliar to many people and so would make the regulation more confusing and more difficult to understand. Use of the “round to even” method could also potentially increase the complexity of determining compliance strategies for fleet owners, particularly fleet owners using Microsoft Excel or similar spreadsheet programs and not familiar with the Visual Basic programming necessary to use the “round to even” method.

Third and finally, the round to even method could also be unfair for fleets with vehicles in some horsepower groups (those with targets that happen to more frequently end in an odd number). Under the “round to even” method, such fleets would be more likely to find their indices rounded up so that they fail to meet their targets.

In cases where numerical rounding is necessary to determine compliance with the regulation, conventional (also known as standard) rounding procedures will be used. In such cases, the fleet number will be rounded to the same decimal

place as held by the requirement. The procedure for rounding will adhere to the standard mathematical method. The number will be rounded up if the first digit that is not included is a five or greater, and will be rounded down if the first digit that is not included is less than five. For example, given a fleet average NOx requirement of 6.2 g/bhp-hr, a fleet with an index of 6.2499 will be rounded down to 6.2, and would meet the requirement. A fleet with an index of 6.2500 would be rounded up to 6.3, and would not meet the requirement. In cases where the requirement is determined to the hundredth decimal place, the same rounding procedures will apply. Given a Diesel PM index requirement of 1.07, a vehicle with an index of 1.0749 would be rounded down to 1.07, and would meet the requirement. A vehicle with an index of 1.0750 would be rounded up to 1.08, and would not meet the requirement.

6)b)x) Define Emergency Operations

- 1. Comment:** Metropolitan crews and equipment often need to respond to unforeseen emergencies to help alleviate an immediate threat to public health or safety. These emergency operation may include those listed in the rule, and may also include emergency, unscheduled repairs to major pipeline breaks. Such large-scale breaks would require the immediate use of heavy equipment from other sources to quickly resolve the problem. Such circumstances would be very different than situations that would occur under routine maintenance or construction. To add flexibility in the definition to account for these emergencies, we recommend the following wording (highlighted in italics):

"Emergency operation means helping alleviate an immediate threat to public health or safety. Examples of emergency operations include repairing or preventing damage to roads, buildings, terrain, *water supply system*, and infrastructure as a result of an earthquake, flood, storm, fire, terrorism, or other infrequent act of nature, *or unforeseen events beyond the control of the in-use off-road diesel-fueled vehicle or equipment operator, (including its officers, employees, and contractors) that threaten public health and safety and that require the immediate temporary operation of such vehicles or equipment to help alleviate the threat to public health and safety*. Routine maintenance or construction to prevent public health risks does not constitute emergency operation".
(SOCALM WD)

Agency Response: To keep the regulation as concise as possible, we opted not to include every possible example of an emergency operation. The examples suggested by the commenter, however, fall within the definition of "helping alleviate an immediate threat to public health or safety" and so would be considered emergency operations for the purposes of the regulation.

6)c) Stringency

6)c)i) Timing (1-10)

- 1. Comment:** Industry cannot meet the new regulations in the unrealistic timeframe. (SCCA2) (CALPASC1) (CTC) (EUCAS5) (BECC)
- 2. Comment:** The industry must be given more time to consider the effects of this proposed regulation and more time to implement it. (GHILOTTIBC) (CUSACK) (JANSSON) (BMM1) (HOBBS) (WILSON) (BES) (COGDILL) (H-CAT) (MAY) (CRS) (GC4) (IUOE2) (AGCA5)
- 3. Comment:** Give industry five more years to comply with the regulation. Industry's fragile infrastructure cannot absorb this regulation without more time. Job loss, business shut downs, and other unintended consequences will occur absent a longer phase in period. (JJAI)
- 4. Comment:** We need ten years to implement the regulation. When you have equipment, you use it for five years to pay it off and then for five years, you make your living from it. (JANSSON)
- 5. Comment:** Construction equipment is very expensive and only after working it for many years do you start to see a break-even point, let alone a profit margin. The timeframe set out by this regulation will make it virtually impossible to recover costs before having to replace an existing piece of equipment with a new one. (LTE)
- 6. Comment:** Please allow time enough to allow us to replace our equipment over a period of time achieving the useful life of the equipment, and then replacement would take place with the latest and greatest technology for reducing emissions. If allowed to gradually obtain the proposed emission level asked for in the proposed CARB regulations I don't see a problem. (BKE)
- 7. Comment:** To require replacement or retrofitting of this equipment in a relatively short timeframe is unreasonable, especially considering that some equipment of this type has a lifespan of more than 20 years. (LACN)
- 8. Comment:** This industry has asked repeatedly for more time and flexibility. With that, we can save some of these jobs. Regardless what happens with this regulation, we will unfortunately lose jobs. It will occur. ARB should request a five year extension from the federal EPA. The savings of jobs will far outweigh the costs associated with an extended time to meet these environmental goals. (OE2)

- 9. Comment:** There is a more realistic approach to cleaning up the air without creating undue financial hardships on the citizens of California. (CUSACK)
- 10. Comment:** When CARB first announced its intention to promulgate these regulations in 2000 in the Diesel Risk Reduction Plan, their plan called for an 18-year timeline to meet the state's goals of reducing particulate matter emissions only. Due to delays in developing this regulation, that timeline has been reduced to 12 or 13 years. (ECGEC) (ECHAMBER) (GC4) (MALDONADO2) (RUNNER) (ECCO5) (PPC) (ACL) (MLD) (QC) (MC) (MCQUEEN2) (STOWE1) (MILLER) (SR) (VC&M) (MCQUEEN1) (EUCA1) (GC2) (STOWE2) (VADNAIS) (SCOTTR) (TCS) (FCICI2)
- 11. Comment:** I stress the original 18 years (as planned in the Diesel Risk Reduction Plan) must go back into the regulation to allow targets to be met cost effectively and allow the manufacturers to safely design systems and technologies to meet the goals. The funding must be available through this process. (QC2)
- 12. Comment:** The regulation cannot be implemented under the proposed timeline without laying off employees and could even result in our company going out of business entirely – which means the loss of many high wage jobs. We need 5 more years to allow pending tier 4 technology to become available and to allow us to be able to afford such costly equipment purchases and retrofits. This will give diesel engine manufacturers time to catch-up with California's progressive air quality standards and help us amortize the massive expense of purchasing new equipment over a longer period, as our own equipment lenders are urging. (ECGEC)
- 13. Comment:** The final compliance targets should be delayed five years due to the substantial changes made to the 2000 Diesel Risk Reduction Plan compliance strategy, which include: (1) an increase in NOx reductions sought from baseline to 32 percent, (2) a decrease in the timeline over which industry can absorb the costs of implementing the plan from 18 years to 10, (3) The addition of mandatory equipment rollover provisions in addition to retrofits and in-use controls and low-sulfur diesel, and (4) the limited supply of VDECS available for off-road equipment and that none currently control to acceptable levels both NOx and PM. (CALCIMA)
- 14. Comment:** The regulation of NOx emissions has been added to what was originally envisioned in the Diesel Risk Reduction Plan, which significantly alters the kind of technology needed for companies to be in compliance. (VC&M)

15. Comment: The Diesel Risk Reduction Plan adopted by CARB in October 2000 had an 85 percent reduction target by 2020, presumably with a year 2000 baseline. Tiechert has a much cleaner fleet now (2007) than it did in 2000, but we still have to reduce emissions by 88.5 percent from 2007 - 2020. CARB's 2009 baseline target does not accurately reflect an actual 2009 California fleet average, so actually PM reductions are much greater than 85 percent from 2000. Changing the baseline year to 2009 and adopting the regulation several years later than anticipated while keeping the same 2020 target date creates a much more stringent regulation than originally proposed. (TA)

16. Comment: If ARB approves this proposal in May 2007, lead time will be thirty-three months and the implementation effective March 1, 2010. This incremental set of variables further complicates the situation and increases the difficulty of responding adequately to the needs our customers will face if the proposed regulation is implemented. (AGCA3)

17. Comment: ARB will have plenty of time to reconsider the regulation. This is a 20-year implementation phase in. ARB can fine tune this regulation as time goes on. If in 2012 or 2015, you realize you are not starting to see the reductions in emissions associated with these regulations, you can refine the regulation and tighten them up. Look at new technologies. Find a better way to get to the end goal, which we are all saying we want to achieve. We just do not want to break the backs of this industry in the process. (BIA-SD2)

18. Comment: Delay the timeline to 25 years and pursue a waiver from the federal government if necessary. (PCCA)

19. Comment: Delay the timeline to 25 years. The complex California economy cannot absorb the turnover of the construction equipment fleet in twelve years. (VCE1)

20. Comment: Instead of a 10-year plan, it should be 15 years due to the size and complexity of the California economy. (FAUCHIER1)

21. Comment: I hope contractors in this state can be assured that changes to existing diesel-powered equipment will be granted reasonable time to comply with cleaner air requirements. Too short a time period could shut down most or all of the smaller operators who cannot afford retrofitting or re-powering their equipment. (GARRETT)

22. Comment: Provide us with an extended time-frame [5-years or not stated] to lessen the financial impact of the regulation, allow affected fleets to properly plan for the transition, and give equipment manufacturers time to produce engines and technology that will meet California's advancing

air quality standards. (CRS) (HOBBS) (CAMARILLO3) (EUCA6) (WPC2) (THARP) (AAWC) (WPC1) (GCSA) (SE) (LEPE) (JOHNSON) (SCCA1) (SCHAAL) (COGDILL) (BCL) (NNC) (ECA) (OE2) (SCCA2) (ECHAMBER) (ECCO7) (ECCO6) (CALCIMA) (THARP) (MALDONADO2) (ANDERSON2) (MLD) (PPC) (ECCO5) (DER1) (RJB2) (PILCONIS) (VADNAIS) (SKANSKA) (CIAQC2) (SCOTTR) (CIAQC7) (TCS) (ANDERSON1) (ECGEC) (GC2) (DER6) (NELSON2) (CHAIN1) (WPC3) (SCCA5)(MAY) (IUOE2) (FCICI2)

23. Comment: CIAQC suggests an alternative that will provide equipment manufacturers the additional five years they need to produce sufficient Tier 4 powered vehicles to meet the final emission reduction requirement and give fleet owners the flexibility to decide how to comply with it in terms of vehicle replacements, repowers and retrofits. (CIAQC2)

24. Comment: The major issue with CARB's proposed regulations is that the technology that is necessary for off-road diesel equipment to be in compliance with the regulations is not available at a price that most companies in the industry can afford. It is estimated that the new regulations will cost the industry over \$9 billion to purchase new equipment or retrofit their current fleets. Extending the implementation timeframe by five years will allow engine manufacturers time to catch up with California's progressive air quality standards and help amortize the massive expense of purchasing new equipment over a longer period of time. Allowing five more years for implementation will save California's contractors from having to pass the extra financial burden on to their consumers, and in many cases, save their businesses. (ANDERSON2)

25. Comment: Delay the regulation to allow time for Tier 4 technology to develop. (CIAQC7) (DER3) (DER6) (ECA) (GC2) (GC3) (ECCO5) (ECCO6) (ECCO7) (BUCKANTZ) (SCCA5)(TCS) (VADNAIS)

26. Comment: ARB should consider relying on vehicle turnover and incentive programs to achieve emission reductions until the technology is available to satisfy the demand for cleaner-burning engines that will ensue. (AGCA3) (PILCONIS)

27. Comment: The benefits of a five-year postponement of the regulation would include the following: If ARB could postpone the NOx provisions until NOx retrofit control technologies become available, the cost would be significantly reduced. One of the main reasons that off-road NOx retrofit technology has lagged behind is there is no clear market for the technology, and there is insufficient data about the number and type of off-road engines where NOx retrofit technology is needed. To obtain this data, ARB needs to do a detailed inventory of off-road engines. After the inventory is completed, NOx control providers will have the data they need

to invest in NOx control technology development. Without this data, cost-effective NOx controls will not be developed. (MCQUEEN1)(MCQUEEN2)

28. Comment: Restoring just five years to the implementation timeframe will give equipment manufacturers time to catch-up and produce engines that will allow the industry to meet California's progressive air quality standards and distribute the massive expense of purchasing new equipment out over a longer period. (MCCULLOUGH) (SR) (MILLER) (BUCKANTZ) (VC&M) (WPC2)

29. Comment: Forcing changes before Tier 4 engines are available is unworkable without massive layoffs and construction companies going out of business – especially smaller ones. (VADNAIS)

Agency Response: We believe the implementation timeframe included in the regulation is necessary, realistic, affordable, and manageable and should remain unchanged. We do not support postponing the effective dates in the regulation.

Although we recognize that compliance with the regulation will be challenging for some fleets, represents a change in the way fleets normally conduct business, and will require the acceleration in the turnover of older vehicles, we believe that the cost of compliance within the current timeframe of the regulation is manageable.

In 2010, the most expensive year of the regulation, it is estimated to impact the California economy by -0.02 percent. If fleets are able to pass along compliance costs to customers, the revenue would need to increase by approximately 2 percent.

During the development of the regulation, staff analyzed and considered many alternative regulatory structures, timelines, and targets. Based on this analysis, staff concluded that delaying the implementation of the regulation by five years would result in an unacceptable loss of emission reductions, making it significantly more difficult to meet the state's air quality commitments and lead to fewer lives saved. Staff's analyses found that a five year delay of the NOx and PM targets would result in losses of 70 percent of the NOx emissions benefits and 72 percent of the PM emissions benefits through 2020. This option, which essentially relies on natural turnover and existing incentive programs, would do nothing to meet the State's 2014 SIP commitments. In addition, this substantial loss of emissions benefits translates into hundreds of lives not saved. See the responses in Chapter III-A-1 of this FSOR regarding why the emission reductions in harmful pollutants are necessary.

The Diesel Risk Reduction Plan (the Plan) was adopted by the Air Resources Board in year 2000 and contained the following proposed schedule for adopting regulations governing in-use off-road diesel vehicles:

- Adopt a regulation for publicly owned in-use off-road diesel vehicles in 2002 and implement it in 2002-2003; and
- Adopt a regulation for privately owned in-use off-road diesel vehicles in 2002 and implement it in 2006-2008.

In addition, the Plan contained an overall goal of reducing diesel PM emissions 75 percent by 2010 and 85 percent by 2020 from year 2000 baseline levels. Many commenters requested that the implementation dates in the regulation be postponed because the regulation was adopted later than anticipated in the Plan. We do not recommend postponing the regulation as requested for the following reasons:

- Postponing the implementation dates would make it even harder to meet the public health goals adopted by the Board in the Plan.
- If the regulation were postponed as requested, we would forego emission reductions, health benefits, and would be unable to meet the SIP commitments for emission reductions. Please see also the responses elsewhere in section III-A-6)c)i) of this FSOR for further a discussion of why we do not recommend postponing the regulation.

Finally, we would also note that, in recognition of the fact that it was adopted later than originally anticipated, the regulation does not meet all the goals in the Plan. The Plan had a goal of reducing diesel PM by 75 percent by 2010, whereas the regulation is projected to reduce diesel PM in 2010 by only 37 percent from year 2000 baseline levels. Indeed, the regulation's first fleet average compliance date for large fleets is not until 2010.

We acknowledge that while the Plan did not include goals for reducing NOx emissions, that does not (and should not) preclude ARB from pursuing all emission reductions necessary to carry out its mission to protect public health, which includes the attainment of ambient air quality standards. As has been noted numerous times, staff needed to pursue NOx reductions in the regulation because NOx leads to formation in the atmosphere of ozone and fine particulate matter. Why substantial NOx reductions are needed is discussed further in Section C of Chapter II of the Staff Report. As discussed elsewhere in this FSOR, many stakeholders, including South Coast and San Joaquin Valley Air Districts, still believe that the regulation does not achieve enough NOx reductions.

Comments MCQUEEN1 and MCQUEEN2 requested that the regulation be delayed to allow time for NOx retrofit control technologies to become available to reduce cost of complying with the regulation. For the reasons stated above, i.e., loss of needed emissions reductions, we do not recommend waiting for a wider availability of NOx retrofit technologies. While the regulation may spur the development of additional NOx retrofit technologies, which may tend to reduce the overall cost of compliance, we do not believe its schedule should be delayed contingent upon the development of such technologies. As described in the

responses in section 3)a) of Chapter 3 of this FSOR, the regulation is affordable even if NOx retrofit technologies do not become available and fleets have to rely on vehicle and engine turnover.

In order to monitor its implementation, the Board has directed staff to report back to it periodically during implementation of the regulation, with the first report required by January 2009. If the Board determines that revisions are necessary, the Board may make modifications to the regulation. However, having the Board assess the implementation of the regulation over time does not necessitate delaying implementation; on the contrary, until the regulation is implemented, it would be difficult to make meaningful adjustments without additional data.

The regulation already contains special provisions for small operators by delaying compliance with the PM requirements, and completely exempting them from the NOx requirements. Because small fleets do not have any turnover requirements and do not have to meet the retrofit requirements until 2015; this provides such fleets seven years in which to determine a compliance path.

The regulation is flexible and does not dictate how a fleet owner must comply; it is not necessary to buy the newest vehicles in any given year. In the years prior to Tier 4 engines being available, the regulation can be met by accelerating turnover to Tier 2 and 3 engines and vehicles and applying VDECS.

We agree with commenters MCQUEEN1 and MCQUEEN2 that it is likely that the regulation will spur development of technologies to meet the new demand for cleaner diesel engines and aftertreatment devices. Delaying the regulation would likely send the wrong signal to technology developers and could actually result in less compliant technology being available to fleet owners.

See the responses in Chapter III-A-2 of this FSOR regarding how technology is available to comply with the regulation and how the regulation has provisions to exempt fleets from action if technology is not available for their particular situation. In particular, see the response to comment III-A-2)c)i) of this FSOR for a discussion of the availability of Tier 4 vehicles and the response to comment III-A-2)a)i) of this FSOR for a discussion of availability of VDECS.

See the response to comment III-A-3)c) of this FSOR for a discussion of why staff believes the total cost of the regulation to be between 3 and 3.4 billion, not \$9 billion. See also the responses in section III-A-3)a) of this FSOR for a discussion of why staff believes the regulation will be affordable. See also the responses in section III-A-3)g) of this FSOR for a discussion of the impact of the regulation on employment. See also the response to comment III-A-6)e) of this FSOR for a discussion of incentive programs that may assist some fleet with early compliance with the regulation.

See also the response to comment III-A-4)f) of this FSOR for a discussion of why we do not believe another inventory of offroad vehicles is necessary.

Please see the responses in Chapter III-A-8 of this FSOR for a discussion of alternatives considered and why the proposed regulation was chosen. In particular, see the response to comment III-A-8)d)i) of this FSOR for a discussion of why we did not recommend the Construction Industry Air Quality Coalitions (CIAQC)/Coalition to Build a Cleaner California (CBCC) alternative.

30. Comment: Under the annual emission reduction targets required under this proposal, many contractors will be required to first re-power or retrofit an engine, only to have to turn around a few years later and replace the entire piece of equipment when the technology to do the job right finally hits the marketplace. (MCCULLOUGH) (SR) (MILLER) (BUCKANTZ) (VC&M) (WPC2)

31. Comment: The proposed off-road regulation, which will force turnover of virtually every existing machine in an unrealistic time-frame, will have devastating effects on our members. The proposal does not take into account that current technology will not meet NOx requirements and the planned Tier 4 technology that will, will not be available for purchase until 2014-15, in most of the horsepower ranges used by the machines used by our members. The NOx portion of the regulation should be abated by a minimum of five (5) years, to allow technology to catch-up to meet the regulatory goals; to do otherwise will force many companies to replace their equipment two times in ten years—a recipe for bankruptcy for most of our members. (SCCA1) (SCCA2)

32. Comment: It would cost my company over \$100,000 to retrofit my equipment which would have to be discarded after 2014 when technology is expected to develop diesel engines that comply with your proposed regulations. My company couldn't survive this expense. I am not against cleaning up the air, but only to wait until the technology is available for compliance instead forcing everyone to retrofit before hand. It would be a waste of money. (CARRI)

33. Comment: The CARB's proposed regulations are not realistic. The regulations would require that we re-power or retrofit all of our engines to Tier 3, and then, when the new technology is developed for Tier 4, we would have to replace all of our Tier 3 engines with the Tier 4 engines. At this time, there are no diesel engines capable of addressing particulate matter and NOx. The lack of equipment technology will seriously hinder compliance. (LESLIE)

Agency Response: Commenters, including CARRI, suggest that, after 2014, they would need to replace vehicles purchased or retrofit prior to then to comply

with the regulation. Presumably, this is because Tier 4 engines then become available. However, staff estimates that in 2020 over 40 percent of the statewide vehicles complying with the regulation will have engines that do not meet the Tier 4 standards, including Tier 2 and Tier 3 engines. As discussed in greater detail in response to comment III-A-6)k)v) in this chapter of this FSOR, fleets will be able to comply without replacing all their vehicles that do not have Tier 4 engines, if they make a reasonable effort to anticipate compliance, most likely without replacing vehicles purchased and retrofit to comply with the regulation. It is important to note that the regulation is very flexible, allowing an owner can decide how best to comply with the regulation. While an owner can choose to replace a vehicle multiple times during the life of the regulation, such an action is not required to do so to comply.

See the responses in Chapter III-A-2 of this FSOR regarding how technology is expected to be available to comply with the regulation and how the regulation has provisions to exempt fleets from action if technology is not available for their particular situation. See also the response to comment III-A-2)c)i) in of this FSOR for a discussion of the availability of Tier 4 vehicles. See also the response to comment III-A-3)a)i)2) of this FSOR for a discussion of the costs to take more than one action on a vehicle during the course of the regulation. See also the responses in section III-A-3)a) of this FSOR regarding affordability of the regulation.

34. Comment: Cummins Inc. has a history of leading the industry in emission technology and we do not anticipate any delay in the production of EPA certified Tier 4 compliant engines. However, we are concerned about our ability to secure the required local engineering and fabrication resources to complete the equipment audits and repowers within the timeframes outlined. (SHANAHAN)

Agency Response: Because the regulation contains provisions to protect fleets if there are delays in the availability of repowers, and because the regulation includes many compliance options other than repowering, we do not believe the timeframes in the regulation need to be adjusted to address potential issues with repower availability. Please see the response to comment III-A-2)b)i) in of this FSOR for a discussion regarding repower availability.

35. Comment: Slow down the mandatory VDECS installation until the potential damage to existing engines can be determined and corrected and the restriction of visibility issue can be resolved. (DCCI)

Agency Response: We do not believe the timeframes in the regulation need to be adjusted to address potential issues with VDECS causing engine damage or visibility issues. If the VDECS requirements were slowed, that would forego diesel PM emission reductions and prevent fewer premature deaths. See also the response to comment III-A-2)a)xviii) of this FSOR for a response to concerns

regarding VDECS causing engine damage. Finally, see the responses in section III-A-2)a)ii) of this FSOR for a discussion of how the safety provisions in the regulation will prevent requiring installation of any retrofits that restrict visibility such that a vehicle cannot operate safely.

36. Comment: ARB needs additional time to determine whether diesel PM has a carcinogenic threshold. Other aspects of California law – such as CEQA – will continue to protect the environment and public during construction projects. (PILCONIS) (AGCA3)

Agency Response: We disagree. As discussed in Chapter I of the Staff Report, the health risks associated with diesel PM are well established. Although some local air districts have used CEQA to require construction projects to utilize cleaner diesel engines or retrofit devices, the application of CEQA has been inconsistent and would not necessarily protect the public from diesel exhaust as effectively as the regulation.

Please see the response to comment III-A-1)c) of this FSOR regarding the toxicity of diesel PM.

37. Comment: We request that the rulemaking be delayed until the ARB can revisit and revise its calculation of economic impacts of the proposed regulation. (TCCHAMBER)

Agency Response: We disagree, and believe that the economic impacts of the regulation have been adequately considered and the regulation should not be delayed.

Please see the responses in section III-A-3)c) of this FSOR for an explanation of why staff believe we have accurately estimated the economic impacts of the regulation.

38. Comment: There should also be assurances that newly purchased equipment will not be required to meet additional standards for a period of 10 years (BCL)

Agency Response: As discussed in Chapter IV of the Staff Report, the following vehicles are exempt from turnover requirements:

- Vehicles less than 10 years old;
- Engines equipped with the best available PM exhaust retrofit, installed within the past six years; and
- Engines meeting the Tier 4 or interim Tier 4 standards.

And, the following engines are exempt from exhaust retrofit requirements:

- Engines in vehicles less than 5 years old;
- New engines that come with a diesel particulate filter (DPF);

- Engines already retrofit with the best available PM exhaust retrofit that achieves at least 50 percent PM reduction at the time of installation; and

Vehicles and equipment not meeting these criteria may be required to be turned over or replaced. However, we believe the exemptions listed above, as well as the inherent flexibility of the fleet average provisions, provide the necessary flexibility and assurances to fleet owners to adequately plan for compliance.

39. Comment: The BACT compliance path requirements currently written in the proposed regulation should be adjusted to be commensurate with proven, affordable, and available solutions. (GC2)

40. Comment: More time is required for this action to:

- Make sure the infrastructure projects are completed on time and budget
- Retain our employment
- Develop improved engine technology
- Better meet equipment demands
- Phase compliance costs in. (SCHAAL)

41. Comment: We need to work out a sensible time line to allow the technology to improve, financial institutions time to get on board to help contractors pay for the devices and, most importantly, time to work out the serious safety issues posed from the placement of these devices on our tractors. (CAMARILLO5) (CAMARILLO6)

Agency Response: Please see response to comment 1 through 28 above. We do not believe the timelines in the regulation need to be adjusted to address any of the issues raised by the commenters above. The implementation dates in the regulation are necessary to achieve the needed emission reductions and public health benefits and to meet the State's SIP commitments. We believe technology will be available to comply with the regulation and have provided adequate provisions in the regulation to exempt fleets from action if technology is not available for their particular situation or if there are manufacturer delays.

For further detail regarding technological availability, see the responses in Chapter III-A-2 of this FSOR. See also the response to comment III-A-3)f)iii) in this FSOR for a discussion of the regulation's impact on infrastructure projects. See also the responses in section 3)a) of Chapter 3 of this FSOR for a discussion of the affordability of the regulation and section III-A-3)g) of this FSOR for a discussion of the regulation's effect on employment. See the response to comments in section III-A-6)e) of this FSOR regarding incentive funding and possible state loan guarantee programs. See the response in section III-A-2)a)ii) of this FSOR for a discussion of the safety provisions built into the regulation.

42. Comment: The only logical solution would be to re-evaluate the Tier 0 and Tier 1 replacement schedule, and allow technology to be developed that is both reasonably priced and that achieves the desired outcome within a reasonable time frame that will have a moderate affect on the California economy. Allowing a one time retrofit/repower to low tiered equipment with a re-evaluation of the life expectancy will help to achieve this goal. (MCDONALD)

Agency Response: We disagree. During the development of the regulation, staff analyzed and considered many alternative regulation structures, timelines, and targets. Re-evaluating the Tier 0 and Tier 1 replacement schedule (i.e., delaying implementation of fleet targets) would cause the loss of emission reductions, making it more difficult to meet the state's air quality commitments and lead to fewer lives saved.

As discussed in prior comments in this section, we believe that there is, or will be, sufficient technology available to comply with the regulation, and that the estimated cost of compliance is manageable. As discussed in prior comments in this section, the regulation is very flexible and an fleet owner is free to decide how best to comply with the regulation. A fleet owner can choose to replace a vehicle multiple times during the life of the regulation, but is not required to do so.

See also the responses in Chapter III-A-8 of this FSOR for a discussion of other alternatives considered.

6)c)i)5) Pace of Regulation too Fast

- 1. Comment:** The only technologically feasible means of meeting the emission targets is to promote installation of VDECS for the entire fleet, at a rate of 10 percent of fleet horsepower per year and allow the natural turnover of equipment to new technology to accomplish the NOx goals in the later years of the regulation. (EUCA1)
- 2. Comment:** One of the major problems with the proposed regulation is the 20 percent retrofitting requirement. If a company has an inventory of Tier 0 and Tier 1 engines, they will be required to install VDECS on Tier 0 engines to be in compliance. As the regulation moves forward in future years, the same fleet will be required to replace the Tier 0 engines with the VDECS to remain in compliance. NWSC's recommendation is for the Board to reduce the PM retrofit from 20 percent to 10 percent. Companies need time to install VDECS and to collect data to develop operating policies and procedures. NWSC has several concerns with the use of VDECS, such as the regeneration time, the useful life of the VDECS, the warranty, the cleaning process, the number of VDECS needed in the installation, exhaust temperatures required, and the engine shutdown time for regeneration. NWSC cannot have a surprise shutdown of the engine due to a VDECS. CARB's cost analysis should calculate the full cost of

the VDECS which includes several VDECS over the useful life of the engine, regeneration time, lost production and maintenance costs. (NWS)

3. **Comment:** We have shown staff that by allowing us to keep our Tier 0 equipment in our fleet until Tier 4 technology is available, then phasing this equipment out of our fleets, and by retrofitting with level 3 VDECS and retrofitting at a rate of 10 percent a year, we would achieve a 50 percent reduction in PM emissions in the first four years of compliance. We have given staff guidelines on how to achieve this goal. We feel strongly that the NOx devices needed for these tractors will be available by the end of 2008 and that would take care of the second part of the regulation. We ask you to consider a 10 percent rate instead of the 20 percent per year rate for retrofits. The early years of compliance are front loaded. If you make the first years of compliance less financially burdensome, we could still compete in the marketplace. (CAMARILLO8) (CAMARILLO4) (CAMARILLO1)

Agency Response: We disagree. By not accelerating turnover of vehicles, almost all of the additional emission reductions of NOx would be lost. By lowering the retrofit rate from 20 percent to 10 percent, we estimate that 44 percent of the PM emission reductions would be lost in 2014, and that 27 percent of the cumulative PM emission reductions would be lost by 2020. The proposed relaxation of the regulation would have significant health disbenefits, including lowering the number of premature deaths that would otherwise be prevented.

Should a fleet owner install a retrofit device, the regulation provides an exemption from turnover for that retrofitted vehicle for six years. Also, the regulation allows retrofit devices to be removed from a vehicle that is to be sold out-of-state or retired. Those retrofit devices could then be used on replacement vehicles (assuming the device is verified for the engine in that particular replacement vehicle) or sold.

Please see the responses in section III-A-3)d)ix) of this FSOR for a discussion of the cost of VDECS and how we took into account installation and regeneration costs. Please see the responses in section III-A-2)a) of this FSOR for a discussion of VDECS technical feasibility.

4. **Comment:** An initial compliance date of 2010 does not provide adequate flexibility for our regulated federal fleets. While state agencies have annual budgets for operation, we operate under longer term budgetary cycles for large scale programmatic changes which span a five to seven year period. We request that CARB revise the initial compliance date for medium fleets to 2015 to account for these federal budgetary constraints. We believe 2015 provides the federal fleets at our facilities the minimum amount of time needed to meet the proposed emission standards given mandatory federal budgetary procedures. Moreover, the 2015 deadline

will ensure that higher horsepower and polluting Tier 0 engines that are phased out can be replaced by new low-polluting Tier 4 engines, available in 2014 and 2015, and won't require subsequent retrofits. (USN)

Agency Response: Staff disagrees. The regulation classifies federal fleets as a large fleet, which is similar to how the State's fleets are classified, with a first implementation date of March 1, 2010. This is almost three years after the Board's adoption date of the regulation. Staff believes that this is an adequate amount of time for federal agencies to plan for compliance. The federal agencies have provided no justification for why they need five additional years to comply. Delaying five years would forego too many emission reductions and be unfair to other large fleets facing the same compliance challenges. See also the response to comment III-A-6b(iv)13) in Chapter III-A-6 of this FSOR regarding why we believe federal fleets such as the Department of Defense should be classified as large.

5. **Comment:** I think that this is too much, too soon, and I urge you to proceed with caution so that we have an effective regulation that will be able to be complied with by the industry and will not cause a burden to California. (TA2) (BIA-SD2) (CEC2) (DER7) (YOW) (BIA-SD1) (FCI1) (VPC) (RJB1) (HUFF) (DAVIES) (GRAFF) (ATA1) (FCICI2) (NBC) (AWD) (TURNER) (FCICI1) (GC2)(TEAMSTERS) (GROVES)
6. **Comment:** The great financial burden can best be mitigated (perhaps through slower implementation or government subsidies or tax credits/offsets). (TURNER)
7. **Comment:** I believe that the regulations will come faster than we can keep up with. I sold 19 Caterpillar twin engine scrapers (657B and 657E), 7 of which I repowered through state grant money to Tier 1. Those machines that I repowered would not be considered clean by the new regulations. I then purchased 15 Caterpillar off-road end dump rock trucks. I did this partly to try to stay ahead of the up and coming regulations. We are currently repowering the 4 oldest machines (those being Tier 1) with Tier 3 engines. Ten of these new machines are Tier 2, and one is Tier 3. This all sounds pretty good, as I have done a lot to stay ahead and to help clean the air. But with the new regulations I will only be good until 2012; then I will need to start repowering or replacing machines at the rate of 1.5 per year. That sounds pretty extreme. (RASMUSSEN)
8. **Comment:** We think CARB is going too far and the consequences of burdening our industry with an unlimited, unfunded mandate will ignite an industry-wide decision to organize into a powerful bargaining block. (DER7)

Agency Response: We disagree that the regulation goes too far, too fast. As discussed in Chapter XI of the Staff Report, throughout the regulation development process, staff considered many possible regulatory structures and elements in the regulation. As part of this, staff also considered requiring higher turnover rates and more stringent NOx averages, but ultimately determined that the higher costs associated with this would likely be more than the industry could bear.

As discussed earlier in this section in the response to comments 1 to 27 in section III-A-6)c)i), we believe the timeline, targets, and cost of the regulation are bearable and necessary, and reasonable.

See also the response to comment III-A-6)e)ii) of this FSOR for a discussion of tax credits.

ARB staff plans to fairly and effectively enforce the regulation to ensure compliance. See the response to comment III-A-11)a) of this FSOR for further discussion of how the regulation will be effectively enforced.

9. Comment: The Federal government has dealt with the equipment manufacturers from clear back in the nineties and had many drawn-out battles over the timetable of being able to implement the effective technology to bring these clean air engines to market. And it has been quite a stretch on the manufacturing end. And what you're asking as a state is to accelerate what the manufacturers already have a problem with. (MCCLAUGHLIN)

Agency Response: We disagree. We believe technology will be available to comply with the regulation and have built provisions into the regulation to exempt fleets from action if technology is not available for their particular situation or if there are manufacturer delays. For further detail regarding technological availability, see the responses in Chapter III-A-2 of this FSOR.

10. Comment: The retrofit requirement should be changed from 20 percent back to 10 percent, as ARB originally proposed in its July 17, 2006, draft of the regulation. As discussed in Part VI.A. of ATA's comments, retrofits are not an "off-the-shelf" solution, and a 20 percent annual retrofit requirement is unworkable -- particularly for GSE. GSE is highly diverse and specialized, consisting of approximately 200-300 makes and models of vehicles, each of which will require a separate engineering effort to attempt to integrate a retrofit. A requirement to retrofit 20 percent of the GSE fleet each year is untenable, and is unsupported by the rulemaking record. (POHLE)

Agency Response: The commenter misquotes the July 17, 2006, draft regulatory concepts. The July 17, 2006 drafts did not include a 10 percent

annual retrofit requirement, but instead included provisions that would have required an even higher rate of retrofit. In fact, it required fleets to “Retrofit all engines older than 5 years (and, for vehicles older than 5 years, any replacement engines or engines installed as repowers) that are not already retrofit with a VDECS with highest level VDECS” beginning in 2009 for large fleets. There were no provisions capping the maximum percentage of each fleet’s horsepower to be retrofitted per year.

As discussed in the responses to comments 1 and 2 earlier in this section, and comment 42 in the previous section, III-A-6)c)i), lowering the retrofit rate from 20 percent to 10 percent would lose an estimated 44 percent of PM emissions reductions in 2014. Please see the response to comment III-A-2)a)xx) of this FSOR for a discussion of the application of retrofits to GSE.

11. Comment: I suggest that in a year, in lieu of a fleet being required to turn over eight percent and retrofit 20 percent of its horsepower under the BACT requirements, it should be allowed to retire 10 percent. So if you eliminate that much horsepower from your fleet, you've taken that pollution out of the air, and those tractors are no longer legal in California (because they are Tier 0), so the state and the area has gained from that loss of pollution. (RTC2)

Agency Response: We believe the commenter is recommending that the regulation allow a fleet that shrinks by 12 percent (150 percent of 8 percent) to be exempt from the PM BACT requirement of retrofitting 20 percent of its fleet horsepower. Staff agrees with the concept of reducing PM BACT requirements for shrinking fleets, but to a different extent and with certain caveats.

Retiring vehicles and shrinking one's fleet is an option to meeting the turnover requirements of the regulation. In the Second Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released on March 6, 2008, we added a new section 2449.2(a)(2)(A)1.b., which stated “Retirement of Tier 0 Vehicles in Lieu of Retrofitting for Fleets with Reduced Horsepower. If since March 1 of the previous year, a fleet’s total maximum power has decreased, the lesser of the total maximum power of Tier 0 vehicles retired since March 1 of the previous year and the total horsepower by which the fleet been decreased may be counted toward the required hp to be retrofit under section 2449.2(a)(2)(A)1.”

12. Comment: One way to partially level this inequity [between large and medium fleets] is to require 10 percent VDECS (not 20 percent) the first three years of 2010, 2011, 2012, until medium fleets must also comply. (RTC)

Agency Response: We disagree. The large fleets represent the significant majority of the emission reductions achieved in the first years of the regulation.

Reducing the PM emission reductions by 50 percent (by reducing the retrofit requirements by 50 percent) would not only affect the emission benefits achieved in those first critical years, but would continue to reduce the benefits of the regulation for the remainder of the life of the regulation.

13. Comment: The proposal would set an unattainable emission reduction standard by requiring 77 percent of all Tier 0 equipment currently in use today to be re-powered to Tier 3 by 2010 and 90 percent by 2020. (AGCA3)

Agency Response: We disagree. As discussed in Chapter VI of the Technical Support Document, by 2020, 92 percent of the Tier 0 engines would be retired through normal attrition, and this does not include projections of expedited fleet turnover as a result of the regulation. By 2020 most vehicles with Tier 0 engines will be 22 years old or older, and most will be considerably older than that. Most of these vehicles will be retired in the normal course of business.

Also, the regulation does not require 77 percent of all Tier 0s to be repowered by 2010. Small and medium fleets do not have any turnover requirement in 2010. Only large fleets are required to turnover vehicles, and this is only 8 percent of their total horsepower annually.

14. Comment: If CARB would lower the fleet regulations to 10 percent retrofits to meet the PM requirements, 5 percent re-powers to meet the NOx requirements, and correctly project financial economic impacts, our company, and the construction and equipment rental industry could adequately absorb these costs and fulfill the requirements for environmental improvements. (THARP)

15. Comment: Finally, staff should consider natural turnover rates of 2 percent to 3 percent per year instead of an unrealistic 8 percent to 10 percent; and after-treatment retrofits should be limited to 8 percent to 10 percent per year to keep the cost of this regulation within the scope of the contractors' reinvestment capital. (QC)

16. Comment: The percentage turnover requirements should be reduced to five percent in early years and then ramp up to six, seven and eight percent. (RJB2)

Agency Response: We disagree. Staff analyzed hundreds of permutations of turnover rates, retrofit rates, and the resulting costs during the course of regulation development. In all cases, there is a trade off between compliance rates with the associated costs and the emission reductions that can be achieved.

As discussed in Chapter XI of the Staff Report, in developing the regulation, staff was striving to achieve the following goals:

- Achieve the maximum, fastest possible, reduction in diesel PM emissions;
- At the same time, maximize NOx reductions achieved by 2015 to aid in attainment of the PM2.5 standards in South Coast and San Joaquin Valley;
- Minimize the cost for fleets and, in particular, minimize the need for fleets to control equipment twice (for example, by having to turn it over twice during the course of the regulation);
- Ensure that the regulation was economically feasible for fleets to comply with;
- Achieve cost-effective emission reductions on a dollar per ton basis; and
- Staff sought to achieve these goals while keeping in mind the technology available today and likely to become available over the next decade.

As discussed in the response to comments 42 to 44 earlier in this section, lowering the retrofit rate from 20 percent to 10 percent would give up an estimated 44 percent of PM emissions reductions in 2014. Lowering turnover to two or three percent would be comparable to natural turnover and hence would achieve no NOx emission reductions. As such, we believe the current compliance rates in the regulation are appropriate.

17. Comment: Forcing the use of VDECS is a tremendous waste of financial capital that could be better used in implementing engine technology, where feasible. Again, the goal of your regulation is to get parallel reductions in NOx and PM, so Tier 4 is an ultimate solution for a fleet like Sukut's. I recommend the timeline defined for PM compliance be extended based on Tier 4 availability, or the PM targets be reduced to a more reasonable level. By doing this, fleet owners can plan the integration of Tier 4 technology rather than being forced to effectively outfit their entire fleet with VDECSs (20 percent per year for the years before Tier 4 are available). (SUKUT2)

Agency Response: We disagree. As discussed in the responses to comments 1 to 27 and 28 to 31 earlier in section III-A-6)c)i) , delaying the regulation until Tier 4 engines are available would sacrifice significant emission reductions. As discussed in the responses comments 1 and 2 earlier in this section, and comment 42 in the previous section, III-A-6)c)i), lowering the required rate of VDECS installation would also lose significant emission reductions.

18. Comment: Humboldt County has 1,200 miles of roads with a significant maintenance deficit. The state's diversion of tax dollars most certainly added to our road problems. ARB's actions to require upgrades at this time will further delay or eliminate road maintenance in our county. We will require a much longer time period to phase in this very costly mandate. (HUMBOLDTCO)

Agency Response: Staff notes that Humboldt County is an attainment area county that does not contribute to downwind violations of the state ozone standard. Therefore, the regulation already exempts fleets captive to Humboldt County from the NOx provisions of the regulation. These fleets do not have any turnover requirements. However, because the population of Humboldt County is greater than 125,000, it does not qualify for the low-population county status in the regulation. As such, Humboldt County will have to purchase retrofits for their vehicles, pursuant to the compliance dates defining small, medium, and large fleets. Like all fleets, Humboldt County will have to identify revenues to take actions to comply with the regulation, including potentially have to redirect funds from other budget items.

See also the first response in Chapter III-A-1 of this FSOR for a discussion of why emission reductions are beneficial even in rural areas.

6)c(ii)1) Set Fixed Targets Rather than Targets Varying Depending on Hp Distribution

1. **Comment:** Instead of providing for “modulating emissions targets based upon the fleet’s horsepower composition, the County proposes that the proposed regulation provide for a fixed fleet average target that can be calculated and ascertained well in advance of the compliance deadline. For example, the fleets’ fixed targets may be calculated in order to ensure that California achieves its 2015 State Implementation Plan target and the ARB’s own 2020 Diesel Risk Reduction Plan target. This modification would provide fleet owners and operators with an extended period of time to achieve the specified emissions reductions, and enable them to achieve the emissions targets in an efficient and cost-effective manner. (GDB)
2. **Comment:** The proposed regulation, as presently drafted, is impermissibly complex and, as a result of such, would impose a great burden on the owners and operators of ground support equipment. Specifically, the proposed regulation’s fleet average requirements and targets are subject to such great variability and unpredictability that effective compliance planning is impossible. The emissions targets identified in the proposed regulation readily vary each year because they are based upon the horsepower composition of each fleet on the given compliance date. As a result, the emissions targets cannot be readily predicted in advance with any amount of certainty. The extent of this uncertainty threatens to render the proposed regulation subject to a legal challenge based upon principles of administrative law and the requirement that agencies not proceed with their decision-making authority in an arbitrary or capricious fashion. (GDB)

- 3. Comment:** The proposed regulation is so complex, and its requirements so variable and unpredictable, that effective compliance planning becomes impossible.

The fleet average approach of the ORD rule should provide fixed fleet average targets well in advance of compliance. ARB has repeatedly adopted such fleet average regulations before, and can readily devise any number of alternatives for the ORD Rule that achieve the same or better emission reductions more efficiently and effectively by removing the extreme uncertainty of the current proposal. The proposed Rule seeks to impose fleet average requirements that vary every year based on the horsepower composition of each fleet on the compliance date—which cannot be predicted in advance with any certainty due to factors beyond the fleet operator's control. This level of uncertainty is unacceptable and ATA suggests below one straightforward example of how the Rule can be restructured to achieve ARB's air quality goals while providing fixed emission requirements known well in advance of compliance deadlines.

The ORD Rule is extremely complex. See, eg, ISOR at 25. Moreover, the proposed Rule's requirements are unpredictable and will not allow our members to know the Rule's emission requirements reasonably in advance of each year's March 1 compliance deadline. As of March 1 each year, each fleet must ensure that its fleet's unique emissions index is at or under the fleet's unique fleet average emissions target, each fleet's emission target and index are calculated based on a complex formula that assigns frequently changing emission targets and emission factors to each vehicle that exists in the fleet on the March 1 compliance deadline, based on that vehicle's horsepower rating.

Thus, from a planning standpoint, the fleet can only determine what its emissions and emissions targets will be for that year based on a prediction of the future composition of the fleet on the next March 1 deadline. To our knowledge, ARB has never before adopted an emission requirement that requires the regulated entity to predict future facts in order to know with certainty what the law requires and to plan accordingly.

Every GSE fleet evolves and changes over time, for a variety of reasons, including changes in aircraft ground support requirements. The precise timing and fleet composition impacts under the Rule cannot be accurately determined in advance, and inadequate allowance is made for changes that occur beyond the operator's control.

As one example, manufacturers control the horsepower of new equipment, not the consumers who purchase and use the vehicles and who are subject to regulation under the Rule. As ARB staff is aware, due to a phenomenon called "horsepower creep," new versions of equipment,

previously provided for many years at a certain horsepower, may only be available from the manufacturer at a different than expected horsepower. This may significantly change a fleet's horsepower composition, and thus a fleet's average emissions and targets under the Rule. For example, if a unit provided at 150 HP is changed by the manufacturer in model year 2016 and only made available at 200 HP, this would change the unit's PM target for that year from 0.14 to 0.08 g/bhp-hr, a 43% more stringent emissions requirement (which would also receive more weight in calculating the fleet's overall emissions target, because it is HP-weighted). See Proposed 2449(d)(1)(A)(2). At the same time, however, the new 200 HP unit would still be deemed to emit the same amount of PM and NOx in g/bhp-hr as a 150 HP unit of the same model year.

In sum, the ever-changing and unpredictable emission targets of the Rule fail to accommodate the need for careful planning to ensure no interruption to the safe and efficient operation of the Nation Airspace System, while ensuring compliance with all applicable laws and regulations. (ATA1)

4. **Comment:** Many of the practical flaws with the ORD Rule can be addressed, without compromising ARB's air quality objectives, simply by providing fleet operators with certainty regarding the level of emission reductions they must achieve. However, ARB failed to include among the regulatory alternatives considered any option for providing fixed (or more predictable) PM and NOx fleet average targets. ISOR at 59-61; *Technical Support Document for Proposed Regulation for In-Use Off-Road Diesel Vehicles* (TSE) (April 2007) at 153-158. As ARB has done with numerous previous regulations, there is no reason why ARB cannot identify an appropriate fleet average emissions approach that provides clear, prospective, and fixed requirements for each fleet.

There is no reason why ARB, in crafting what appears to be the most burdensome and costly off-road in-use regulation ever proposed or adopted in the United States, cannot (at a minimum) make clear a reasonable period of time in advance the precise requirements that fleet operators must meet. The Executive Officer has determined that the proposed Rule "may have a significant statewide adverse economic impact," and asks the public for submission of alternative approaches, including "consolidation or simplification of compliance and reporting requirements." However, ARB staff has not identified or evaluated in the rulemaking record any approach that provides fixed fleet average targets for NOx and PM. As it has done in many previous regulations, we are confident that ARB staff can develop a proposal that sets forth clear prospective requirements for the regulated community to achieve.
(POHLE)

- 5. Comment:** The off-road diesel regulation does not allow our operators to accurately predict the impact of controls. This is because the fleet index and control target must be re-calculated every 12 months and no allowance is made for changes that occur beyond the operator's control. New vehicles may only be available in the higher horsepower ranges. Horsepower creep by the original manufacturers could skew the fleet average targets upwards, again creating a practical barrier to compliance. (CSIA)

Agency Response: We believe basing of the fleet average targets on the horsepower composition of each fleet is necessary, fairer to fleets than not doing so, and very similar to the structure of other previously adopted ARB regulations. The targets will not vary very much, and, if they do vary it will only be because of changes made to fleet composition that were under the full control of the fleet. Thus, the targets are predictable enough to allow fleets to do long-term compliance planning.

The regulation bases the fleet average targets for each fleet in part on its horsepower composition. For example, the NOx targets are calculated using the equation below:

"Diesel PM Target Rate = [SUM of (Max Hp for each engine in fleet multiplied by Target for each engine in fleet) for all engines in fleet] divided by [SUM of (Max Hp) for all engines in fleet] where Target is the PM target in g/bhp-hr from Table 3."

Taking the horsepower composition into account is necessary because the new engine standards adopted by U.S. EPA and ARB have been phased in under different schedules and at different levels of stringency for each of the eight horsepower groups covered by the regulation (25-49 hp, 50-74 hp, etc.). (Table V-3 in the Technical Support Document shows the new engine standards and their phase-in schedule for each horsepower group.)

If the fleet average targets were set based on a fleet's initial horsepower distribution without taking into account its current horsepower composition, some fleets could find themselves in a very difficult situation because of changes in fleet horsepower distribution. That is, if a fleet shifted its horsepower distribution over time such that it contained more vehicles of horsepower ranges with later, less stringent new engine standards (for example, by owning more vehicles with engines over 750 hp and fewer with engines between 175 and 750 hp), the fleet might find it very difficult or impossible to meet the fixed targets. In model year 2011, for example, the PM standard for a 749 hp engine is 0.01 g/bhp-hr PM, whereas that for a 751 hp engine is 0.07 g/bhp PM - seven times higher. If a fleet experienced horsepower creep and suddenly owns a number of engines at 751 hp rather than at 749 hp, and its targets did not adjust up, because its

engines were emitting seven times higher than before, it could find the targets impossible to meet. Such a fleet would be at a disadvantage compared to a fleet whose horsepower distribution does not change over time or whose horsepower distribution shifts toward horsepower ranges with earlier, more stringent new engine standards. To avoid this situation and make the regulation fairer, we opted to calculate the annual targets based on each fleet's current horsepower distribution.

We recognize that targets could become slightly more stringent due to horsepower creep, as noted by commenter ATA1 and CSIA. However, the change in target that ATA1 describes (a 43 percent more stringent target for 200 hp) is not expected to be significant for a fleet with many vehicles. Airport ground support equipment fleets typically contain many thousands of horsepower, so changing the target weighting for 200 hp would not be expected to make a noticeable difference in the overall target for the whole fleet.

Most fleets' horsepower distributions will remain constant over time or will vary only a small amount, and any change in the horsepower distribution is under the full control of the fleet. The only reason that a fleet's horsepower distribution will vary is due to vehicle retirement or addition. If a fleet does not add or retire vehicles, or if it always replaces vehicle with one in the same horsepower group, its targets will remain exactly as they were calculated at the start of the regulation. Because the targets will only shift due to actions by the fleet (purchases or retirements), each fleet has complete control over if and when its targets shift.

In addition, it is important to note that fleets always have the option of meeting the BACT requirements (8-10 percent turnover and 20 percent retrofit). The fleet average compliance option, in fact, was added to the regulation at the request of affected stakeholders including the Air Transport Association (ATA). If the fleet average targets are not attainable in one year or if fleets do not wish to plan for complying with the fleet average targets, they may choose to meet the BACT requirements instead.

The portable engine ATCM (Section 93116) is a fleet average rule with fleet averages structured almost exactly like those for the off-road regulation. The portable engine ATCM sets targets for three years for three horsepower groups. Fleets calculate their average PM emission factor for vehicles each horsepower group using the equation in 93116.3(d),

PM Emission Fleet Average = Summation for each portable engine in the fleet
(bhp x emission factor) / Summation for each
portable engine in the fleet (bhp).

Note that the similarity of this equation with the one above for Diesel PM Target Rate. The only differences between the portable engine ATCM structure and that of the regulation are described below:

- Instead of having a horsepower weighted target, like the off-road regulation, the portable ATCM requires fleets to meet three independent targets for each of three horsepower groups in each target year. If a fleet owns equipment in all three groups, then it must meet three independent targets. During the workshop process, in an early draft of regulatory concepts, we proposed an identical structure for the off-road regulation, but we received the comment from stakeholders including the Air Transport Association (ATA) that they would like the ability to control vehicles in one horsepower group more and vehicles in another less but still achieve the same emission reductions (i.e., the ability to trade off between horsepower groups). The off-road regulation allows fleets this additional flexibility through its horsepower weighted target, but the portable ATCM does not.
- Instead of using eight horsepower groups, the portable engine ATCM lumps the eight horsepower groups into three. We opted to include all eight for greater precision and fairness to fleets that have vehicles in just one horsepower group. During the workshop process, in an early draft of regulatory concepts, we had proposed lumping the horsepower groups similar to the portable engine ATCM but subsequently included all eight groups after we received the comment from stakeholders that that would be unfair to fleets that own vehicles in just one horsepower group, because they could be subject to targets that are inappropriate for their vehicles.

Commenter ATA1 claims that ARB has never before adopted “an emission requirement that requires the regulated entity to predict future facts in order to know with certainty what the law requires and to plan accordingly.” We disagree. First, the off-road regulation does not require fleets to predict future facts that are out of their control. As described above, fleets control their own horsepower mix by controlling which vehicles they choose to retire and buy. Also, the off-road regulation contains the BACT provisions that allow fleets to determine their BACT requirements with certainty a year before their next March 1 compliance date (because they are based on taking action on a percent of the previous year’s total horsepower). Fleets need never do more than these BACT requirements and may choose to comply with them if they prefer them to meeting the fleet average targets. Second, any regulation that includes fleet average provisions – like the transit rule, portable engine ATCM, off-road large spark ignition rule, etc. – contains some element of “predicting future facts” to plan for meeting the requirement. Fleets need to predict what their fleet composition will be so they can ensure they meet the fleet averages. If they are planning to add equipment or vehicles, they must research and plan for the emission characteristics of possible equipment or vehicles they will buy, so that they meet the fleet

averages. Thus, the off-road regulation requires no more “predicting future facts” than other fleet average regulations.

We also do not believe the regulation is impermissibly complex. Please see the responses in section III-A-5)a) and III-A-5)a)i) in Chapter III-A-5 of this FSOR for a discussion of why we believe the regulation is by necessity somewhat complex, but why we believe its complexity is manageable and still allows fleets to plan for compliance.

The other alternatives considered by staff when developing the regulation are described in Chapter X of the Technical Support Document. Please see also the response in section III-A-8)d)ii) of this FSOR for a discussion of why the Board did not adopt the proposal suggested by commenter POHLE.

Please see the response in section III-A-2)c)i) for a response to the CSIA concern regarding vehicle availability.

Finally, please see the responses to comments 7. and 27. in Chapter III-A-19 of this FSOR for further discussion of why we do not believe the regulation is arbitrary or capricious, and is not preempted by federal aviation laws.

6)c)ii)2) Make Fleet Average Targets Less Stringent

- 1. Comment:** The fleet average targets for PM are set too low in the regulation. The fleet average targets for NOx are too low. NWSC’s recommendation is for CARB staff to review the current targets and increase them 13%. (NWS)
- 2. Comment:** We are concerned with the overly aggressive fleet average targets. (GC2)

Agency Response: We disagree. The fleet average targets were set to achieve the emission reductions needed by the regulation. Staff recognizes the regulation has strict provisions and will be challenging to comply with for some fleets as it will require the dirtiest fleets to retrofit 20 percent per year of their horsepower per year in the early years of implementation. As stated in Chapter I of the Staff Report, the regulation would provide greatly needed reductions of NOx emissions in the South Coast and San Joaquin Valley air basins. These areas must achieve significant NOx reductions from the off-road sector to achieve ambient ozone and fine particulate matter (PM2.5) standards by the federally-mandated deadlines. In addition, the regulation would also contribute to achieving the 2020 goal set forth in the 2000 Diesel Risk Reduction Plan of reducing diesel PM 85 percent from all diesel sources from 2000 baseline levels. The emission reductions from the regulation would be expected to prevent approximately 4,000 premature deaths and tens of thousands of cases of asthma-related and other lower respiratory symptoms, and provide a benefit of \$18 to \$26 billion in avoided premature death and health costs. Any loosening of

the fleet average targets would result in a loss of health benefits throughout the state.

3. Comment: In the regulation, the diesel PM fleet target average is the driver for overall compliance, and ARB has proposed stringent diesel PM fleet target averages for large GSE fleets for compliance years 2010 through 2013. In the ISOR, ARB staff fails to discuss whether these 2010-2013 targets are technologically or economically feasible for large GSE fleet owners. As stated in United's prior written comments to ARB on March 19, 2007, as applied to United's GSE fleet, the interim diesel PM fleet targets are unreasonable even under the most aggressive of GSE fleet turnover scenarios. For example, even if United were to turnover approximately 10 percent of its affected GSE fleet on an annual basis, adding only electric-powered vehicles, United would still be unable to demonstrate compliance with the diesel PM fleet target averages for 2010-2013. The severity of these interim targets is further compounded by the lack of available incentive funds to help large GSE fleet owners comply with the regulation. The early diesel PM fleet average targets are unreasonable and impose unduly harsh requirements on large GSE fleet owners, who constitute less than one percent of all vehicles affected by the ORD Rule. United respectfully requests ARB to revise the regulation and circulate for consideration a new set of reasonable early diesel PM fleet average targets for large GSE fleet owners. (ENDSLEY)

Agency Response: The commenter notes that we did not explicitly discuss whether the 2010 to 2013 targets are technologically or economically feasible for large GSE fleet owners. That is true. However, as acknowledged by the commenter, GSE constitute less than one percent of all vehicles affected by the regulation, and – to keep the Staff Report and Technical Support Document a reasonable length – we did not discuss separately the feasibility of the regulation for each and every small subset of affected fleets.

We believe the fleet average targets in the regulation are reasonable, and – as discussed further in section III-A-3)a)i) of this FSOR – that the regulation is affordable. As explained in the staff presentation to the Board on May 25, 2007, the fleet average/BACT structure of the regulation means that no fleets are required to meet the targets. We recognize that many fleets will be unable to meet the targets in the early years (2010 to 2013) and therefore will need to comply with the BACT provisions. If United is in that situation, they can choose to comply with the BACT provisions.

We do not believe that GSE should be allowed to emit NOx and PM at levels that are detrimental to human health and the environment. GSE is subject to the regulation, and GSE fleets must meet the targets just like all the other off-road fleets in California. Additionally, the off-road regulation contains section 2449(d)(1)(A)3.b., which states that any electric vehicles added to a fleet

between 2010 and 2016 will receive double credit (i.e., all electric vehicles added to the fleet will count as double the horsepower with PM and NOx emission factors of zero). This provision was added at the request of the Air Transport Association, and should be useful for fleets like United's that have the opportunity to shift to electric GSE. For more information how GSE fleets are affected by the regulation, please see the responses in section III-A-6)a)vii) of this FSOR.

6)c)ii)3) Set New Targets Based on a New Inventory and Longer Schedule

1. **Comment:** The PM and NOx targets should be reviewed and re-established based on an accurate California equipment inventory and a realistic 15-year declining schedule. (GC2)

Agency Response: We disagree. Staff believes that the emissions inventory estimates presented in Chapter III of the Staff Report and Chapter VI of the Technical Support Document represent the best available information on off-road vehicles to date, and provide a reasonable estimate of the emissions from mobile in-use off-road diesel vehicles greater than 25 hp. For an additional discussion on the off-road inventory, please see the responses in Chapter III-A-4 of this FSOR.

The reasons for maintaining the schedule in the regulation are explained at length in the responses in section III-A-6)c)i) in this chapter of this FSOR.

6)c)ii)4) Effect of Targets On Timing of Owners Purchase Decisions

1. **Comment:** As a result of the “far-reaching” targets of the regulation, our customers have stated they will hold off on new purchases until higher tier engines are available. This has hampered the progress of the tremendous emission reductions we have seen over the last 6 years with normal attrition and repowers of this equipment. (QC)
2. **Comment:** A lot of contractors are going to wait until the Tier 4 engines are available. (SPR)
3. **Comment:** The regulation encourages us to keep Tier 0 and Tier 1 equipment in our fleet as long as possible instead of replacing these pieces with newer ones. We should get Tier 0 equipment out of our fleets rather than add PM retrofits to them and keeping them longer. (TA)

Agency Response: In order to develop a regulation that achieves the needed emission reductions, staff worked with stakeholders through workshops and meetings and gathered data over a period of three years. During this process, staff realized that there would be a period of uncertainty where fleets might delay purchases until the requirements of the regulation were clear. However, the requirements of the regulation in 2010 to 2014 will force fleets to take some action to reduce emissions before Tier 4 engines are available. The regulation

will push fleets to accelerate turnover to Tier 2 and Tier 3 and to apply retrofits in early years.

Additionally, we acknowledge that some fleets may choose to retrofit older vehicles and keep them in their fleet longer. We feel that allowing a fleet to choose which vehicles to retrofit gives fleets extra flexibility within the regulation; however, once retrofitted, those vehicles only have a guaranteed life in the fleet of six years. After the six years has passed, a fleet will most likely need to replace those older vehicles to meet the NOx requirements of the regulation.

6)c)ii)5) Use Individual Fleet Average Baselines from 2000

1. **Comment:** The fleet average provision should allow fleets to reduce their emissions based on the individual fleet's baseline average. This would ensure that those fleets that took the initiative to clean up their equipment early (since 2000) would get full credit for doing so and would have an advantage over dirtier fleets. The current fleet average provision is based on arbitrary fleet targets and requires an 85% PM reduction from a 2009 baseline that does not correspond to a fleet's actual baseline, and which no fleet actually meet or exceeds. (TA)

Agency Response: We disagree. It would not be fair to require reductions from individual baselines; fleets that started cleaner would be penalized, and forced to reduce their emissions a large amount, while older fleets would experience more relaxed requirements, and not need to upgrade as much of their fleet as required in the current regulation. Also, it would be difficult to enforce the proposed provision from the commenter. This is because there are no verifiable records of what fleets looked like in 2000. It is also not clear under the commenter's proposal on how to address fleets that came into existence after 2000.

Also, the comment is incorrect in stating that the regulation's fleet averages are based on an 85 percent PM reduction from a 2009 baseline. The regulation was developed in part to meet the goals of the Diesel Risk Reduction plan, which are to reduce statewide diesel PM emissions 85 percent from a 2000, not a 2009 baseline; the regulation is currently expected to meet those goals.

6)c)ii)6) Base Targets on Horsepower-hour

1. **Comment:** A "fleet average" of horsepower should be computed for each fleet. The output of emissions is not just related to horsepower, but to horsepower/hours (the actual usage of this horsepower). A parked engine does not emit. A more accurate way to regulate emissions should take in the number of hours each piece of equipment works times the amount of available horsepower. (DCC1)

Agency Response: In section 2449(d)(2), the fleet average provisions allow fleets to account for hours of use in their fleet average calculations. It allows

fleets the option of complying with an activity-weighted fleet average rather than a fleet average based solely on horsepower and emission factor. These provisions will allow fleets to focus their compliance funds on vehicles that are heavily used. Such fleets may choose to keep a few older, dirtier vehicles that are used rarely and therefore do not count heavily in their hours-weighted fleet average.

6)c)ii)7) Use Three-year Fleet Averages

- 1. Comment:** CALPASC feels strongly that a triennial compliance component (targets every 3 years instead of every year) would aid significantly in allowing the industry to comply more effectively (CALPASC4)
- 2. Comment:** We respectfully request that the Board authorize the 3-year fleet average when determining compliance (targets every 3 years instead of every year). The three year fleet averages would allow fleet owners maximum flexibility to manage the transition, would allow more engine technology options to achieve compliance including Tier 4, and assures emission reduction are achieved every year by using a “reasonable further progress” increment (40% of required improvement in the first two years). (CBCC2)
- 3. Comment:** The staff is proposing a certificate of compliance be issued each year to assure that companies meet the enforcement targets. And that certificate of compliance becomes an enforcement tool so that public agencies won't let people bid or perform work if they haven't been able to produce that. And if it's sewn into CEQA, then developers won't allow them on the property because they haven't met the targets. That's fine in normal business cycle. But every now and then is a dip year, like this one is where revenues are off about 40 percent. Contractors survive a dip like that by spending no extra money, and in a year like that, without the ability to add additional bank financing, which they won't have, and they'll have no profits. They won't be able to meet the enforcement targets in one year and, therefore, they won't get the certificate of compliance and, therefore, they will have zero revenues in the next year because they won't be able to bid or perform any work. So this combination of a one-year fleet average and a certificate of compliance will cause significant financial hardship when we hit a bad year, and then you're going to take down thousands of medium-sized businesses. We really need the three-year fleet average. (FAUCHIER3)

Agency Response: ARB staff analyzed the effect of three year fleet average targets with various incremental improvements in the first two years and compared the emissions benefits expected to those expected from annual requirements. The results of the analysis showed that the three year average goals lowered the emissions benefits of the regulation, and caused a significant

increase in emissions during the first two years of each three year reporting period. This analysis is described in Attachment 3: Analysis of Alternatives to the Proposed In-Use Off-road Diesel Vehicle Regulation to the First Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released on December 21, 2007. Table III-A-6)c)ii)7)-1 below shows the reduction in emissions benefits that would be incurred by using three year fleet average targets.

Table III-A-6)c)ii)7)-1 - Reduction in Emissions Benefits Using Three Year Fleet Average Targets

Compliance Interval	Compliance Years	Interim Year Requirements	2015 Loss in Benefit
3-yr targets-80%	2011, 2014, 2017, 2020	80%	-3%
CIAQC 3-yr targets	2011, 2014, 2017, 2020	20% in 2010, 40% in second yrs	-17%
3-yr targets	2011, 2014, 2017, 2020	100% in 2010, 40% in second yrs	-11%
2/3-yr targets	2010, 2012, 2014, 2017, and 2020	none	-8%

The flexibility of the three year average reporting period also produces the effect of amplified emission reductions in the final year. For example, using a three year target, with 40% compliance requirement over the initial two years, the third year would require actions meeting 60% of the emissions reductions necessary in the three year period. This amounts to about 180% of the emissions reductions required in any single year using annual requirements.

While the staff recognizes that the added flexibility could be used by many resourceful fleet owners to plan the transition of their equipment or wait until the release of Tier 4 engines, the overall effect of the change would encourage the delay of implementing emission reductions, and result in many fleets dealing with the majority of emissions reduction requirements in a relatively short period. Furthermore, three year fleet average targets could negatively impact the availability of retrofits and engine repowers during the final compliance years as fleets seek to complete the majority of the actions necessary over the three reporting period in the third year.

We do recognize the importance of making provisions in years where industry does not achieve a profit and may have difficulty absorbing the cost of the regulation. However, three year fleet average targets would not consistently aid

fleet owners in this regard. As noted above, the three year average would have a substantially increased requirement for emissions reduction in the final year. If this inflated requirement occurred in conjunction with a year in which profits were not seen, the three year fleet average target proposal would significantly increase the financial hardship.

We recognize the concern of FAUCHIER3 regarding compliance during difficult economic times, and we acknowledge that the construction industry is currently in a downturn. The regulation currently does include a provision for economically adverse periods, in section 2449.2 (A)(2)(A)(1)(b) of Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008. The provision allows for the retirement of Tier 0 vehicles to provide credit towards the turnover of horsepower outlined by the BACT program. For example, a fleet owner could retire 20% of their horsepower to meet the BACT requirements, and no further action would be necessary in that year in order to receive a certificate of compliance.

Please see also the response to comment III-A-6)k)vii)9) of this FSOR for a discussion of why the regulation does not contain further economic hardship provisions.

Please see also the response to comment III-A-9)i) of this FSOR for a discussion of how the 3-year target proposal relates to the Surplus Off-road Opt-in for NOx (SOON) program.

6)c)iii) Not Fair to Have Stricter Requirements for Large Fleets

- 1. Comment:** The regulation should be fair to all fleets by placing all fleets on a level playing field with the same start date. The Off-road ATCM was developed with a competitive disadvantage by having different compliance dates for different fleet sizes (large fleets in 2010, medium fleets in 2013, and small fleets in 2015). During the last round of workshops, the stakeholders expressed their concerns about the competitive disadvantage. The regulation requires considerable funding on some fleets and no funding on other fleets for five years. When all the fleets return to the market place, there will be a shift in the marketplace because of the regulations. NSWC's recommendation is to change the regulation to place all fleets on a level playing field by requiring all fleets to comply with the PM and NOx requirements beginning in 2015. (NWS)
- 2. Comment:** Why are small companies excluded from this regulation? A bulldozer from a small or large company pollutes at the same rate. If 20 to 30% of the state's fleet horsepower is owned by small companies, why are medium and large companies being asked to pick up (finance) a disproportionate share of the problem? Either a small or large contractor's ability to absorb these costs is directly proportional to the business they do

and no different for one or the other. If the purpose of this regulation is to reduce emissions, why is CARB excluding as much as 20 to 30% of the fleet horsepower (i.e. small fleets) from these regulations? (SHAWM1)

3. **Comment:** What compounds our problem is that we are located in an area where we compete with smaller companies. These companies would not have to comply with the regulation for years after us or fly under the radar and not have any upgrading of equipment. (ANDREINI)
4. **Comment:** The majority of our fleet is Tier 0 and Tier 1. We're a very large contractor in this business. And we feel that we're being unjustly called a large business and not given the same amount of time as a small business or a medium fleet. (TC)

Agency Response: As stated in section E of Chapter IV of the Staff Report, staff proposed an earlier initial compliance deadline for the largest fleets because staff believes the largest fleets have the resources to understand and comply rapidly with the regulation. Additionally, enforcing the regulation early in the implementation process for just the relatively few largest fleets would present less of a challenge than enforcing the regulation for the very numerous smallest fleets. In these first years of implementation, ARB inspectors would have the opportunity to better learn the industry and observe common violations. Staff proposed more time to the smallest fleets that are also small businesses, because many of them are one or two-person operations, for whom learning about and understanding the regulation may be a bigger challenge. In addition, smaller fleets would have fewer compliance options to choose from because of the limited number of vehicles they own. That is, larger fleets may be able to select their easiest, lowest cost vehicles to clean up in the early years, thereby giving themselves additional time to find solutions for their more expensive or difficult to control vehicles. Small fleets with only a few vehicles may not have this opportunity.

6)c)iv) Do Not Strengthen Regulation

1. **Comment:** We do not support any further strengthening of the off-road diesel regulations. (ARA1)

Agency Response: We agree. In adopting the regulation and not a more stringent proposal, the Board indicated that the adopted regulation will achieve the necessary PM and NOx emissions benefits within the economic limits of the affected industries.

6)c)v) Section intentionally left blank.

6)c)vi)1-4) Stricter NOx Limits for Largest Fleets

1. **Comment:** The regulation should also be tightened to achieve additional NOx reductions in the South Coast and San Joaquin Valley. We request that in extreme non-attainment areas, large fleets be required to meet more aggressive emission reduction targets in the South Coast and the San Joaquin Valley. Fleets that do business both within and outside of the extreme nonattainment areas should have to accelerate total fleet turnover or retrofit, and ensure that the low-NOx engines are deployed in these regions. We note that the regulation contains provisions for delay if technology is not available, i.e. in the event that manufacturers have difficulty meeting the demand due to earlier deadlines. Given the extraordinary difficulty of meeting federal standards and the substantial public health effects that would result from delay, we believe the more aggressive standard is not only justified, but is absolutely necessary. We urge that the regulation is amended to include these requirements. (CAPCOA)
2. **Comment:** This regulation can go further and it can get more NOx reductions. And I think the Board has to seriously consider the possibility of strengthening the regulation. There are health-based air quality standards that regions of the state are not meeting. And this regulation is critical to meeting those standards. (UCS4)
3. **Comment:** We believe that the ARB can and must do more than the current regulation. Strengthening the regulation makes economic sense. The current regulation has a benefit-to-cost ration of approximately seven to one. Staff has estimated that the total cost of the regulation to be between \$3.0 and \$3.4 billion with the economic savings from health benefits to be between \$18 and \$26 billion. The benefits of strengthening the regulation will still far outweigh the costs. Foregoing a more protective regulation will hurt disadvantaged populations the most. (CERA)
4. **Comment:** The regulation of in-use off-road diesel vehicles will not go far enough to protect public health and meet air quality standards required by law. Staff has decided that it will cost the owners of the largest fleets too much to move more quickly to retrofit, repower, or replace the oldest, dirtiest, and deadliest diesel engines. We do not agree. (UCS2)
5. **Comment:** We ask for greater nitrogen oxide reductions to help meet clean air deadlines in the most polluted areas of our state. For example, the South Coast and the San Joaquin Valley continue to struggle to meet health protective air quality standards. ARB must ensure that the level of reductions from this rule is consistent with regional air pollution needs. These needs could be partially met through more stringent NOx fleet averages and fewer exemptions to turnover and retrofit requirements. (UCS3)

6. **Comment:** We ask that ARB revise the regulation to (1) set more stringent NOx emission limits for the largest off-road fleets sufficient to assure compliance with federal air quality attainment deadlines, (2) increase the annual large fleet turnover requirement rate from 8 percent to 15 percent, (3) adopt a Tier 3 or higher repower and pre-owned purchase requirement for large fleets, and (4) remove the exemption for Tier 1 or higher engines from turnover requirements. (CERA) (UCS2)
7. **Comment:** The regulation does not go far enough in reducing emissions of nitrogen oxides (NOx). For the San Joaquin Valley to attain the federal ozone standard, NOx emissions must be reduced by approximately 75 percent from the 2005 level. The regulation combined with fleet turnover is expected to reduce NOx emissions by only about 61 percent from the 2005 level. The regulation for in-use off-road diesel equipment could be strengthened by making the fleet requirements more stringent, both in terms of compliance schedules and fleet averages. The ARB must strengthen the regulation to assure that the 75 percent NOx reduction goal will be achieved as soon as possible, and should also do the following:

 - Increase the stringency for large fleets, specifically for the larger horsepower ranges starting from 175 HP engines.
 - For large fleets with 40 percent Tier 0 and Tier 1 equipment, increase the turnover rate from 8 percent to 15 percent per year.
 - Require that engines used for repower be Tier 3 or higher,
 - Require that engines in purchased pre-owned equipment meet Tier 3 standards or higher.
 - Remove the exemption for Tier 1 or higher engines from turnover requirements.
 - Apply the most stringent requirements to fleets in air basins upwind of serious (or worse) ozone nonattainment areas. The exemption for captive fleets in attainment areas must not apply to fleets in air basins upwind of serious (or worse) ozone nonattainment areas.

(SJVAPCD)
8. **Comment:** The regulation is less stringent than the earlier drafts resulting in foregone reductions of 3.5 tons per day of NOx in the South Coast Basin in 2014. Additional NOx reductions from off-road vehicles could be achieved through greater turnover in the early years to cleaner vehicles or through compliance with more stringent fleet average NOx targets. These additional NOx reductions from this source category are also both technically and economically feasible. (SCAQMD1)

Agency Response: We believe that the adopted regulation will achieve the necessary PM and NOx emissions benefits within the economic limits of the affected industries. As stated in the Staff Report, the regulation has the strictest provisions for the largest fleets, which have the most significant emissions and

which are most likely able to rapidly understand and absorb the costs of regulation compliance. Large fleets would be subject to the PM and NOx requirements beginning in 2010. Large fleets with the oldest vehicles would need to accelerate turnover of engines to 8 percent of their horsepower per year and install exhaust retrofits on 20 percent of their horsepower per year beginning in 2009. In 2015, the oldest large and medium fleets would need to further accelerate turnover to 10 percent of their horsepower per year.

We believe the regulation as structured provides the greatly needed reductions of NOx emissions in the South Coast and San Joaquin Valley air basins, and requiring additional NOx reductions is not feasible since we believe the regulation already represents the economic limit of what industry could bear. Additionally, allowing early credit for repowers to Tier 1 engines before March 1, 2009, and Tier 2 repowers for compliance with the NOx requirements allows fleets a lower cost option for compliance with the regulation. Many vehicles currently do not have Tier 3 repower options available, and we believe that taking away the ability to repower to a Tier 2 engine would be financially detrimental for a fleet trying to meet the compliance requirements. Similarly, limiting the ability of a fleet to purchase used Tier 2 vehicles in the early years would also remove a cost-effective option for compliance. However, we would like to note that the addition of used vehicles to a fleet is limited as the regulation progresses, and in the later years, only Tier 3 vehicles can be added to the fleet if the fleet targets are not being met.

Additionally, we do not agree with removing the exemption for Tier 1 turnover in the early years of the regulation. The focus of the requirements in the first few years addresses Tier 0s and uncontrolled Tier 1s because those are the highest emitting engines. Additionally, as shown in section C of Chapter VI of the Technical Support Document, in 2005 over half of the statewide fleet was still Tier 0 vehicles. Therefore, many large fleets will have Tier 0s and uncontrolled Tier 1s in their fleets when the regulation begins in 2010. Many fleets have upgraded their Tier 0 vehicles with Tier 1 engines to prepare their fleet for the upcoming regulation, and some made these improvements before Tier 2 vehicles/engines were available. In the regulation, as adopted, the Board acknowledged these emissions reductions that were achieved through early upgrades to Tier 1s, and provided fleet owners the ability to use these engines for the first few more years the regulation to allow them to recoup part of their investment.

Believing that the regulation was pushing fleets to their economic limits, the Board concluded that any further emissions reduction requirements should require financial incentives. As a result, the Board directed staff to add the Surplus Off-Road Opt-in for NOx (SOON) program to the regulation for the purpose of using public funds to achieve additional emissions reductions beyond those that will be achieved by the in-use off-road diesel vehicle regulation.

The SOON program is described fully in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008.

The SJVAPCD comments suggests applying more stringent requirements to fleets in air basins upwind of serious (or worse) ozone nonattainment areas. We do not believe the regulation should be structured in this manner because – as discussed further in the response in section III-A-6)a)iii) of this FSOR – we believe it is preferable to keep the regulation as uniform statewide as possible.

The SJVAPCD comments states that the exemption for captive fleets in attainment areas must not apply to fleets in air basins upwind of serious (or worse) ozone nonattainment areas. We agree, and the only counties included in the list in the captive attainment area fleet definition are those that attain all national ambient air quality standards and that are not upwind contributors to downwind violations of the state ozone standard.

For a more detailed discussion on the affordability of the regulation, please see the response in section III-A-3)a)i) of this FSOR.

Please see also the response in section III-A-8)d)iii) of this FSOR for a more detailed discussion of the SCAQMD proposal very similar to that proposed in the SJVAPCD comment.

6)c)vi)5) Sunset the Low-use Exemption

- 1. Comment:** The regulation should include a sunset provision to the low-use exemption for the oldest dirtiest equipment by 2015. The current low-use exemption applies to equipment that operates on average less than 100 hours per year and encourages fleets to move equipment in this category to avoid cleaning them up. (CERA) (UCS1) (UCS2) (UCS3)
- 2. Comment:** The low-use exemption should include a sunset provision by 2015 to prevent vehicles with no pollution controls from operating indefinitely. The current low-use exemption, which applies to equipment that operates on average less than 100 hours per year encourages fleets to move vehicles into this category to avoid cleaning them up. As a result, the percentage of low-use vehicles as part of the overall construction fleet is likely to grow over the period of the regulation. In addition, enforcing the low-use provision is highly problematic as each vehicle must be inspected to ensure that hours-of-use meters have not been tampered with. ARB adopted a sunset provision in the portable equipment regulation to avoid having highly polluting equipment operating indefinitely.

Compliance options available when the low-use exemption sunsets include leasing of equipment for the short time that it is needed (less than

100 hours per year). This cost-effective compliance path was not evaluated in the staff report as an alternative to repowering or retrofitting a low-use piece of equipment. Specialty equipment exemptions could still apply to address equipment and retrofit availability concerns.

While we are proposing the date of 2015 as the appropriate date to sunset the exemption, the board should at least exclude the oldest and most polluting vehicles from the low-use exemption at the end of the compliance phase-in period in 2020. Tier 0 and uncontrolled Tier 1 vehicles operating in 2020 will be 30 to 50 times more polluting than an equivalent Tier 4 engine, meaning a low-use vehicle operating for 100 hours could emit the equivalent of 3 to 5 year worth of emissions from a Tier 4 machine. (UCS1)

Agency Response: We disagree. As described in Chapter XII, Section A. of the Technical Support Document, it is not currently cost-effective to control low-use vehicles. We do not expect it will become cost-effective to do so in 2015 or 2020. We do not believe it is practical for all fleets to rent or lease vehicles to replace low-use vehicles, as suggested by commenter UCS1. For example, during regulatory development, staff met with several fleets that have operations that are remote from any rental yards. Staff also met with other fleets that said it is difficult or impossible to find rental vehicles to meet their specialized needs.

We acknowledge that as the remainder of the fleet is cleaned up due to implementation of the off-road regulation, uncontrolled low-use vehicles will become responsible for a greater percentage of the total emissions of off-road vehicles. However, we expect Tier 0 and 1 low-use vehicles to move out of the fleet eventually due to normal attrition.

To address stakeholder concerns regarding the difficulty of enforcing the low-use provisions, ARB staff included requirements in section 2449(g)(2) for continued reporting for low-use vehicles even after the final fleet average compliance date. Fleets with low-use vehicles must continue to report annually as long as the fleet owns or operates the vehicle.

6)c)vi)6) Add Protections for Sensitive Receptors

- 1. Comment:** The regulation should require additional protections for children, the elderly, and other sensitive populations. (UCS2) (CERA)

Agency Response: As discussed in Ch. XII, Section F of the Technical Support Document, staff considered including special requirements for off-road vehicles used near sites where sensitive receptors would likely be present, such as at schools and hospitals. However, staff concluded that the regulation will provide significant health benefits to sensitive receptors for two primary reasons. First, the long term risk, which is normally measured over a 70-year life span, associated with exposure to any one single construction project is expected to be

low. Secondly, construction projects are already subject to an environmental review process through local agencies and/or under the California Environmental Quality Act (CEQA). This process ensures that the adverse environmental impacts of a project are identified and mitigated. Staff has suggested that local agencies may choose to impose additional in-use operational controls or impose additional requirements through the CEQA process to reduce the short term health impacts to sensitive receptors from these projects.

Additionally, because of the transient nature of off-road diesel vehicles, it is difficult to incorporate special provisions for sensitive receptors into a statewide regulation. Adding a sensitive receptor requirement would add complexity to the regulation and make compliance and enforcement much more difficult.

Staff also concluded that since the regulation requires the introduction of cleaner off-road diesel vehicles into fleets throughout the state, the risk to sensitive receptors will decrease as the regulation is implemented, just as it will for all breathers in California.

6)c)vi)7) Set Final Compliance Earlier than 2020 and 2025

- 1. Comment:** The compliance dates for the fleet average performance requirements extend too far into the future. There is a long delay in full implementation of the PM requirements which will allow diesel pollution to continue to cause substantial harm to human health and the environment. The attainment deadline for the federal PM 2.5 standard is in 2015. However, the large fleet final compliance date is 5 years after this attainment deadline, and some fleet will actually not fully comply with the PM requirements of the regulation until as long as a decade after this attainment deadline. There is no reason to wait so long when the technology to reduce diesel PM exists today. The regulation should advance the fleet average performance requirements by 5 years for all fleets and advance the initial compliance dates for medium fleets by 3 years. Small fleets should have compliance dates in 2015 and achieve final compliance by 2020. (CATF1)

Agency Response: The commenter is correct in stating that the deadline for attainment of the federal PM2.5 standard is 2015, and that significant emission reductions are urgently needed to meet that deadline. However, we disagree with the suggestion to tighten the compliance dates for fleets for a number of reasons. First, the commenter is incorrect that the regulation relies on normal attrition. The regulation effectively requires, starting in 2010 for the largest fleets, significant annual turnover at a rate that exceeds historical levels, in addition to the retrofit of older vehicles each year. Second, as discussed in Chapter 1, page 3, of the Staff Report, staff believes the regulation represents the economic limit of what industry will be able to bear under present economic conditions. Any requirements for further emission reductions would likely require financial

incentives from the State, and the incentive funds necessary for this are not presently available.

The regulation, as adopted, is expected to achieve greater emission reductions than any previous diesel measure adopted by ARB. In total, the regulation is expected to reduce 187,000 tons of NOx emissions and 33,000 tons of PM emissions between 2009 and 2030. The final regulation achieves significant emission reductions in a cost-effective manner that will significantly reduce the number of premature deaths and illness attributable to diesel PM and ozone. ARB proposed an aggressive off-road diesel regulation that has a timeline that begins prior to the SIP dates in order to accomplish emission and health benefits before 2015, which is a major milestone year for the federally mandated State Implementation Plan (SIP). This regulation achieves emission reductions necessary to meet SIP needs. The regulation also meets the goals of the Diesel RRP approved by the Board in 2000, calling for an 85 percent reduction in risk associated from diesel PM by 2020.

6)c)vi)8) Set Stricter NOx limits for SCAQMD

- 1. Comment:** The regulation should be strengthened to increase the amount of NOx reductions from the emissions sources. Greater emission reductions of NOx are technologically feasible and can be achieved from this regulation. Additional NOx reductions will provide critical emission reductions needed to attain federal and state air quality standards and will prevent additional hospital visits, asthma attacks, and heart and lung disease. (UCS1)
- 2. Comment:** The regulation does not adequately address NOx reductions for the South Coast Air Basin. ARB staff should consider enhancing the proposed regulation to maximize NOx reductions, which are critically needed in order for the South Coast Air Basin to meet the PM2.5 and the 8-hour ozone federal air quality standards. The regulation also does not adequately address NOx emissions and the associated health impacts. The regulation would only achieve 11% and 30% NOx reductions in 2014 and 2023, respectively, compared to 53% and 72% PM2.5 reductions in those same years. While the proposed PM requirements would achieve substantial health benefits, the regulation falls short of establishing equally stringent NOx requirements to maximize the overall public health benefits. (SCAQMD1) (SCAQMD2)

Agency Response: We disagree. The regulation does provide greatly needed reductions of NOx emissions in the South Coast and San Joaquin Valley air basins. These areas must achieve significant NOx reductions from the off-road sector to achieve ambient ozone and fine particulate matter (PM2.5) standards by the federally-mandated deadlines. The deadline for the attainment of the PM2.5 standards in these regions is currently 2015, so emission reductions are urgently needed.

Requiring additional NOx reductions, without providing monetary incentives, is not feasible since the regulation already represents the economic limit of what industry could bear. As stated in the Staff Report on page 3, any further emissions reduction requirements would likely require financial incentives.

Recognizing the need for further NOx reductions, the Board directed staff to add the Surplus Off-Road Opt-in for NOx (SOON) program to the regulation. The SOON program allows local districts to achieve additional emissions reductions beyond those that will be achieved by the in-use off-road diesel vehicle regulation if public funds are made available to affected fleets. The SOON program is described fully in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008.

6)c)vi)9) Include Snow Removal Vehicles

- 1. Comment:** We recommend the inclusion of snow removal vehicles in the fleet average performance requirements of section 2449(d)(1). We see no compelling reason to exempt this equipment. (CATF1)

Agency Response: We disagree. We built an exemption for snow removal vehicles into the regulation because snow removal benefits public health and safety. Snow removal operations provide a public service not only to the traveling public, but also for emergency vehicle access. Special provisions for snow removal were also included in the Diesel Particulate Matter Control Measure for On-Road Heavy-Duty Diesel-Fueled Vehicles Owned or Operated by Public Agencies.

6)c)vi)10) Remove BACT Requirements

- 1. Comment:** The alternative BACT requirements of section 2449 (d) (2) should be eliminated from the regulation. The fleet average requirements provide substantial compliance flexibility and will provide substantial environmental benefits. The additional BACT option will not add much in real incremental flexibility, will not likely improve environmental benefits, and will add a complex new layer to the regulation. It will likely increase substantially the administrative burden to regulatory agencies to effectively implement the rule. We also recommend ARB consider a monetary penalty for non-compliance with the fleet average requirements. The proceeds could be added to the Carl Moyer Program or to other programs dedicated to reducing emissions from non-road diesel vehicles. (CATF1)

Agency Response: We disagree. The regulation includes BACT requirements in order to provide fleets flexibility in complying with the regulation and in recognition of the fact that many fleets will not be able to meet the fleet average

targets, especially in the early years of regulatory implementation. Fleets that start out with primarily Tier 0 vehicles would largely not be able to bear the financial burden of meeting the fleet average targets in 2010, for example, because the targets would require them to retrofit and/or turn over a large portion of their fleet immediately. Fleets have the option of meeting the fleet average requirements or BACT retrofit and/or turnover requirements to demonstrate compliance with the regulation.

Penalties will be issued if a fleet is not in compliance with the regulation. Penalties are established under the Health and Safety Code. (See H&SC §§ 99674, 39675, 42400 et seq., and 43016.) Funding for the Carl Moyer Program is established by the Legislature (see H&SC § 44275 et seq.). Penalty assessments go into the Air Pollution Control Fund; before ARB can expend money from the fund for incentive programs it must obtain a specific appropriation from the Legislature. ARB has in the past requested such appropriations and will likely continue to make such requests in the future.

6)c)vii) Remove NOx Requirements

- 1. Comments:** While I understand the role of NOx in secondary particulate and ozone formation and appreciate efforts to reduce NOx emissions, the inclusion of NOx control in this regulation:
 - Deviates from the core regulatory mandate, which is the reduction of directly emitted air toxic emissions from diesel engines.
 - Greatly increases regulatory complexity and costs to what is already an expensive regulation.
 - The regulation should therefore focus first on PM control and then phase NOx control once substantial progress has been made on the primary (PM) objective. (CBIA)
- 2. Comments:** ARB should postpone the NOx requirements for a period of 5 years to ensure that technology can keep up with the proposed regulations. (SCOTTB)
- 3. Comments:** Adding NOx to the regulation makes it more difficult and far more costly to comply. (GLATKY)
- 4. Comments:** We believe that the add-on cost for the NOx portion of the ORD rule is much too high, and we agree with the Construction Industry Air Quality Coalition (CIAQC) that the ORD rule be postponed. (MCQUEEN2)
- 5. Comments:** Please eliminate the NOx requirements from the current proposed regulation. (SKANSKA)

Agency Responses: We acknowledge that the addition of the NOx requirements added cost and complexity to the regulation. However, these

requirements were included in the regulation because of the need to substantially reduce emissions of NOx to meet ambient air quality standards. As discussed in Chapter II of the Staff Report and Chapter IV of the TSD, NOx leads to formation in the atmosphere of ozone and fine particulate matter (PM2.5).

In fact, as discussed elsewhere in this FSOR, many stakeholders, including the South Coast and San Joaquin Valley Air Districts, still believe that the regulation does not achieve enough NOx reductions.

The rationale for not postponing the regulation's requirements by five years is presented in the response to comment III-A-6)c)i) in Chapter III-A-6 of this FSOR. Please see also Chapter III-A-3 of this FSOR for a discussion of cost and affordability. Also, please see Chapter III-A-1 of this FSOR for a discussion of the need for emission benefits from this regulation.

6)c)viii) Develop Off-Road Smog Check Program

- 1. Comment:** The regulation should mandate yearly opacity testing for in-use off-road diesel vehicles. The yearly mandated opacity tests are the main thing that is driving the movement toward higher compliance and lower over-all emissions for on-road trucks that have benefited our State.

I believe the new regulations covering in-use off-road construction equipment would see the same levels of improvement and compliance as the in-use on-road truck fleets have if yearly opacity testing were mandated in the same manner as it has been with the truck fleets. It is the simplest and most reliable final test to verify the success of all the required changes to off-road diesel vehicles. All the pledged engine replacements and exhaust system additions/modification, and other expensive procedures required of equipment owners will be much harder to quantify and verify without the simple test results of a yearly opacity test reading done in the field. It is a relatively inexpensive, quick, and accurate, hands-on test that shows the results of millions of dollars of capital investments.

I truly believe that the yearly opacity test requirements is the best, most efficient way to ensure the success of your over-all program to reduce dangerous diesel particulate emissions from In-use, Off-road, construction equipment. (T&D)

Agency Response: We opted not to include opacity testing in the regulation because the benefits of opacity testing are substantially less than those provided by the regulation. Opacity testing is a means in which to ensure an engine is operating properly and does not have excessive visible PM emissions. However, the use of highly effective DPFs (as provided under the regulation) should ensure that visible emissions from retrofit diesel engines are essentially zero, thereby negating the need for opacity testing. In addition, as has been discussed elsewhere in this FSOR, the intent of the regulation is to achieve emission

reductions from the in-use fleet. In addition, opacity testing only measures visible emissions; it does not measure most of the diesel PM that is emitted as PM2.5 (which is not visible to the human eye), nor does it measure NOx emissions. Newer, cleaner engines will provide significant emission benefits that cannot be realized through opacity testing.

Additionally, there is no accepted test method for opacity testing of in-use off-road diesel vehicles, and we did not want to delay development of the regulation to take the time to develop and solicit input on a new test method. We also recognized that mandating opacity testing would add additional cost and inconvenience for affected fleets. Should the need arise the Board could consider requiring opacity testing of off-road vehicles in a future rulemaking.

6)c)ix) Exclude Units Exempt from the PM BACT Requirements when Calculating the Percentage Retrofit Rate

- Comment:** Clarify that units exempt from the PM BACT path should not be included in calculating the percentage of the fleet that must be converted. The regulatory language discussing the calculation of the Retrofit Rate should be clarified. The Rule should make clear that units exempt from the retrofit requirement are not to be counted as part of the fleet's "total maximum horsepower" in calculating the percentage that must be retrofitted. (POHLE)

Agency Response: Staff made minor editorial clarifications to the regulatory language in section 2449.2(a)(2)(A)4. detailing the exemptions from the PM retrofit requirements in the Second and Third Notices of Public Availability of Modified Text and Availability of Additional Documents. However, the intent of the regulatory language has always been that the exemptions from the PM BACT requirements are only provided to vehicles if all other vehicles in the fleet that are not exempt have already been retrofitted. As a result, so long as any remaining vehicles in a fleet can safely be fit with retrofit devices, there are no exemptions provided that would exclude another vehicle's horsepower from being counted towards the fleet's total horsepower.

We disagree that exemptions from the PM BACT path should reduce a fleet's overall horsepower for the purposes of calculating the number of necessary retrofits that need to be performed. Excluding vehicles in this way would produce an inaccurate analysis of the fleet's total horsepower, and, because the BACT provisions base the required rate of annual turnover and retrofitting on a certain percent of a fleet's total horsepower, would reduce the emission reduction benefits of the regulation.

6)c)x) Retrofitting Prior to BACT Exemptions

- Comment:** Examples of working emission reducing models elsewhere should be closely checked by the staff. One of the mentioned district

regulations penalizes tier 1 and tier 2 engines because they have BACT. Tier 0 engines are allowed because there is no BACT available to them. The purpose of the regulation should be to decrease NOx and PM, using this district as a primary example is wrong. (ESCOBEDO)

Agency Response: Commenter ESCOBEDO may be referring to local air district construction mitigation programs that require highest level VDECS, and which may exempt Tier 0 vehicles because they have no highest level VDECS. The regulation differs significantly from any local air district program. The combined PM and NOx provisions in the regulation will guarantee that fleets make progress toward reducing both pollutants, even if a fleet starts out with Tier 0 vehicles that have no highest level VDECS.

2. **Comment:** ARB should revise the regulatory language to make clear that a fleet owner need not retrofit 100% of its other units before being eligible for the exemptions. The exemption provision is poorly worded and should be revised to clarify that an operator need not already be in the process of retrofitting 100% of its units before any of the regulatory exemptions apply. (POHLE)

Agency Response: In the Third Notice of Public Availability of Modified Text and Availability of Additional Documents released on March 5, 2008, the regulatory language in this section was modified to make ARB's intent clear that exemptions are in fact not available until after retrofits are installed in all non-exempt vehicles.

The ARB never intended that exemptions could be used before all retrofits were performed. If section 2449.2(a)(2)(A)4. were changed as suggested by the commenter, a fleet required to install retrofits on 20 percent of its horsepower could avoid having to install any retrofits in a particular year by showing that 20 percent of its horsepower met one of the criteria in section 2449.2(a)(2)(A)4.a. through d. Such a fleet could use this provision to avoid retrofits in subsequent years as well because retrofits were inappropriate for 20 percent of its horsepower. Instead, the original regulatory language in section 2449.2(a)(2)(A)4. indicates the fleet must show that "all its vehicles meet one of the criteria" in order to be exempt from the retrofit requirements. In other words, the fleet must have retrofit all possible vehicles before it can use the exemption.

6)c)xi) Unfair that NOx Requirements Added

1. **Comment:** ARB staff's recommended regulation could cause over two thirds of the privately owned construction companies in California to shut down or at least downsize from a large fleet to a small fleet, primarily because only the largest, most progressive companies have the resources to replace or repower most of their vehicles with Tier 3 equipment commencing in 2010 and again with Tier 4 equipment commencing in 2014 or 2015 in order to comply with the 2020 fleet average. Your staff's

last minute addition of a NOx emission reduction requirement will eliminate even these companies from compliance. (CIAQC2)

2. **Comment:** The regulation of NOx emissions that has been added to the regulation significantly alters the kind of technology needed for companies to be in compliance, and the availability of equipment that reduces both PM and NOx emissions. ARB staff added NOx emissions reductions to the proposed rule in the last few months. (EUCA1)

Agency Response: We disagree that NOx requirements were added at the last minute. The requirements for NOx emissions were first added to the regulatory concepts on July 21, 2006. This was over a year before the Board voted on the regulation. As stated on page 12 of the In-Use Diesel Off-Road Equipment Rule Regulatory Concepts – July 2006 Update (available at http://www.arb.ca.gov/msprog/ordiesel/documents/reg_concepts_07_06_update.pdf), staff proposed adding NOx emission requirements because recent estimates of the health impact due to diesel equipment show that the mortality from secondary particulate matter formed from diesel NOx emissions can be as severe as that due to direct diesel PM. In addition, the South Coast and San Joaquin Valley have attainment deadlines for fine particulate matter and eight-hour ozone standards approaching in the 2015-2025 timeframe. In order to achieve these health-based standards, the State needs to dramatically reduce NOx emissions.

We acknowledge that the NOx provisions will require fleets to take additional action from what they would have had to do if the regulation had been adopted as purely a diesel PM regulation.

However, contrary to commenter CIAQC2's claim that the regulation will put two thirds of construction firms in the state out of business, we believe the regulation will be affordable for most fleets. The affordability of the regulation is discussed further in the responses in section III-A-3)a) of this FSOR.

We believe adequate technology will be available to meet the regulation's requirements. The responses in Chapter III-A-2 of this FSOR address technology availability.

6)c)xii) Adding Vehicle Requirements Too Strict

1. **Comment:** An owner will not be able to buy a Tier 2 or Tier 3 machine starting in 2012 or 2013 (depending upon horsepower range) without first adding PM aftertreatment.

An owner will not be able to purchase a Tier 4 Interim machine in the horsepower range of 25 HP to 74HP starting in 2016 without adding additional PM aftertreatment. (CIAQC3)

Agency Response: We agree that in some cases the stringency of the regulation may have been overly prohibitive with respect to purchasing used vehicles. Therefore, in the first Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released on December 11, 2007, we removed the requirement to meet PM targets when adding vehicles. The adding vehicles requirements now do not require any fleet owner to place PM aftertreatment on a vehicle in order to add it to their fleet; some fleet owners may however choose to put aftertreatment on as part of their strategy toward meeting the fleet average PM targets.

2. **Comment:** The restrictions on adding vehicles in 2449(d)(7) will reduce the trade-in value of higher tier used machines, creating a much higher new machine purchase price. (CIAQC3)

Agency Response: We disagree. As discussed in the response to section III-A-2)c)i) of this FSOR, we anticipate the net result of the rule will be to cause little or no increase in demand for new vehicles but instead would be to cause an increase demand for relatively new, used vehicles both in-state and out-of-state as this will likely be the least-cost option for fleet owners to comply with the rule. Therefore, we do not believe the regulation will increase the purchase price of new vehicles.

We do recognize that the regulation might reduce the value of used Tier 0s that must be sold out of state and Tier 1 machines sold in California and out of state, and we took this into account in our cost analysis. However, as noted in the previous response, the provisions for adding vehicles will always allow, in every year and horsepower category, for the purchase of used vehicles.

3. **Comment:** Instead of the restrictions on adding vehicles in 2449(d)(7), staff should require:

- If a used machine is required to replace an existing machine, the machine must have a higher tier engine than the one being replaced.
- If adding used machines (additional horsepower to meet business expansion) the machine should have an engine meeting Tier I or better until 2012, Tier 2 or better between 2012 and 2017, and Tier 3 or better starting in 2018. Owners would be required to add a CARB verified particulate filter within 3 years of purchase of the used equipment.
- If adding new machines (additional horsepower to meet business expansion), they should contain engines that legally meet the current model year standards including flex engines as allowed by EPA and CARB. Any new machine containing a Tier 2 or Tier 3 engine would not be required to add a verified particulate filter for machines less than 5 years old. (CIAQC3)

Agency Response: The recommended alternative solution has significant drawbacks:

- Basing requirements for a replacement machine on the previous vehicle's engine tier would require owners to specify exactly which machine a purchase is replacing, which would in many cases be difficult or impossible. This also would not be possible for vehicles added due to fleet growth. Such a requirement would add considerable tracking complexity and, in staff's opinion, would be too burdensome.
- The tier requirements suggested would result in a loss of emissions reductions benefits compared to the regulation, and would potentially delay the fleet's ability to meet NOx and PM targets. Staff does not believe fleets should be making purchasing choices that move them further from meeting the fleet average targets.
- The regulation no longer provides PM requirements specific to the addition of vehicles to a fleet. We agree that fleet owners should meet the current year's emission standards when adding vehicles if possible.

4. Comment: The restrictions on adding used vehicles in section 2449(d)(7) are overly aggressive. In some years, owners could only add new machines, and even these new machines would require PM filters. The restrictions will interfere with owners' adding necessary machines to accommodate business growth. The restrictions on adding vehicles will prevent companies from growing. (CIAQC3)

5. Comment: The restrictions on adding vehicles in section 2449(d)(7) affect new vehicle purchases. (CIAQC3)

6. Comment: No used machine can be purchased for 25 hp to 49 hp in 2012 and 50 hp to 74 hp starting in 2019. (CIAQC3)

Agency Response: We disagree. The regulation never limits a fleet owner to purchasing only new vehicles. Fleet owners have flexibility in choosing how they will comply. Staff disagrees with the analysis on the effects of the regulation when adding vehicles to fleets, but does agree that in some cases the stringency of the regulation may have been too strict with respect to purchasing used vehicles. Staff has removed the requirement to meet PM targets when adding vehicles, which removes any requirement to add after-treatment to a new machine unless the fleet owner chooses to do so in order to meet a fleet average PM target.

Other than the restriction on not adding Tier 0 engines after March 1, 2009 there are no restrictions on adding any vehicle to a small fleet prior to 2015, and a medium fleet prior to 2013.

For fleets that met the most recent NOx and PM fleet average targets, starting in 2010 the only requirement when adding vehicles to the fleet is that the vehicle be

Tier 1 or higher, and that the fleet will still meet emission standards within three months of adding the vehicle. In 2020, the minimum requirement of Tier 1 is replaced by a Tier 3 requirement. Although ARB recommends acquiring the machines with the lowest emission rates possible, the following examples show the flexibility of the regulation.

A fleet that met the emission standards in 2019 could still purchase a used Tier 1 machine in any horsepower range, as long as the addition did not cause the fleet to exceed the most recent standards. This allows the purchase of used machines up to 19 to 23 years old in 2019, depending on horsepower category. After 2020, fleets that meet fleet average targets will be able to purchase Tier 3 vehicles that do not cause them to exceed to the most recent emission standards. This will allow for the purchase of used machines 9 to 14 years old in 2020, again depending on horsepower category.

For fleets that did not meet the NOx and PM fleet averages, the adding vehicles requirements are more stringent but still allow for the purchase of used vehicles in all cases.

The following chart displays the tier requirements when adding vehicles to a fleet that did not meet the most recent NOx and PM targets.¹⁵ By comparing the requirements shown in the chart with the “NOx Emissions by Horsepower and Year” which displays engine tiers, we can determine age of vehicle allowed to be added. Note that for all horsepower groups, Tier 2 vehicles, which are available

¹⁵ Staff analyzed the requirements for adding vehicles to fleets that met the most recent fleet average targets by using the table “NOx Emissions Factors by Horsepower and Year”. The requirements for adding vehicles to fleets that did not meet the most recent emission targets were analyzed by comparing the NOx Emissions Factors with the table “Large and Medium Fleet NOx Targets for Use in Calculating NOx Target Rates”. This information is available in Attachment 1: Staff's Modified Text to the Original Proposal to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents. The provisions regarding the addition of machines to a fleet are detailed in section 2449(d)(7), the NOx Emissions Factors are listed in Appendix A, and the Large and Medium Fleet NOx Targets are listed in section 2449.1(a)(1)(A)1.

today for all horsepower groups, are allowed to be added to fleets through 2014 (i.e., for another six years). Fleet owners are never restricted to adding only new vehicles.

Compliance Date	25-49 hp	50-74 hp	75-99 hp	100-174 hp	175-299 hp	300-599 hp	600-750 hp	>750 hp
2010								
2011								
2012					Tier 2			
2013								
2014								
2015								
2016								
2017					Tier 3			
2018								
2019				4 Initial			Tier 4 Final	
2020				Tier 4 Final				Tier 4 Initial

6)d) Credit Provisions

6)d)i) Early Credit Provisions

- Comment:** The value of the emissions reductions that have been achieved since 2000 cannot be underestimated. Further substantial reductions could be achieved before 2010 if greater credit were given for those early reductions. Without incentive credits, most contractors will wait until compliance deadlines force them to retire or replace equipment, and no significant air quality benefit will be realized before 2010. (CIAQC7)
- Comment:** When the Diesel Risk Reduction Plan was released, fleets that were aware of the upcoming regulation took two approaches: either clean up their fleets early or wait for the regulation to be finalized before doing anything. Most companies who took the early compliance path are now questioning their decisions. For a regulation that emphasizes early reductions so strongly – why are we not recognized for our early reductions? (TA)
- Comment:** In 2000, when the diesel risk reduction plan was adopted, a lot of companies who knew about it and realized the impact it was going to have had two different choices that they could make. Some chose to do nothing short of the bare minimum that they had to, to keep operating, waiting to see how this all played out and how it would affect their business. Others of us chose to do everything we could do clean up our fleets. Teichert has one of the cleanest fleets in the state. We have less than ten percent Tier 0 engines, and we still do not meet the PM fleet

average targets. The cleanest fleets suffer the greatest economic impact due to this rule, and that just seems unfair that doing early implementation would not benefit our company. (TA2)

4. **Comment:** There is no credit given for voluntarily replacing over 20 Tier 0 engines with Tier I engines and Tier 0 engines with Tier 3 engines, at a cost of over \$5.5 million over the last 5 years for PM emissions. We are still simply noncompliant and must replace the prescribed 20 percent VDECS solutions. It will have been of little benefit to our company to have done this early and voluntarily with regards to meeting the requirements. From a business standpoint, we wasted our money trying to be proactive with early, voluntary replacement. There should be a reward for early, voluntary efforts by equipment owners rather than a penalty. (SHAWM1)

Agency Response: We recognize that early actions to reduce emissions were valuable, and the regulation includes credit for such early actions. In response to input from stakeholders similar to that expressed in the comments above, provisions for early carryover credits were added to the regulation after the March 2007 workshops. The regulation allows early carryover credit to be obtained for repowering engines, retiring vehicles, and installing retrofits that reduce particulate matter (PM) before March 1, 2009. Repowers prior to March 1, 2009 may be Tier 1 or higher, and count as single turnover credit towards the NOx BACT requirements. Additionally, early turnover credit can be obtained by retiring Tier 0 vehicles between March 1, 2006 and March 1, 2009 at a rate greater than 8 percent per year of total horsepower. Turnover that is in excess of this amount can also be counted towards the NOx BACT requirements. Also, the early installation of exhaust retrofits (before March 1, 2009) counts as double credit towards the PM BACT requirements.

Staff acknowledges that there is more credit given to repowers and exhaust retrofits than there is credit given for vehicle retirement and replacement. We feel that fleets who have repowered with newer engines in the past have taken conscious steps in improving the air quality; the normal practice of many fleets is to continually rebuild engines (such as Tier 0 engines) back to their original standards. Similarly, fleets would normally not install exhaust retrofits on their vehicles. Although there are air quality benefits from their installation, VDECS do not serve to help a fleet in increase productivity, or provide other business advantages. We also feel that because few retrofits were verified for off-road at the time of the proposed regulation, providing incentive for fleets to be on the forefront of installing retrofits would be beneficial for technology demonstration and to develop familiarity with retrofits. Therefore retrofits installed prior to March 1, 2009, give a fleet twice as much credit. Replacement and retirement credit was treated differently because we feel that many fleets have a naturally high turnover rate, and it is difficult to distinguish a fleet's natural turnover from the actions taken in preparation of the regulation. We believe allowing credit for retiring any Tier 0 vehicle prior to the start of the regulation would be attributing

an emissions benefit to a business's usual retirement practices, and therefore, only turnover in excess of that required by the regulation can be counted towards early compliance. If we gave too much credit for turnover that would have happened normally, we would forego later emission reductions. We feel that a balance was achieved between providing appropriate credit to assist fleets in achieving BACT requirements, and obtaining sufficient emissions benefits.

Finally, it is important to note that when a fleet performs any actions to reduce the emissions from their vehicles, they move closer to meeting fleet average emission targets. Therefore, even if a fleet does not obtain early NOx BACT credit from Tier 0 retirements, the reductions in the PM and NOx fleet averages will help the fleet reach their fleet average targets sooner than they normally would have, and with potentially fewer actions taken.

The public health risk from diesel exhaust and the required emissions reductions to protect public health are discussed in Chapter IV of the Technical Support Document, and the responses to comments in Chapter III-A-1 of this FSOR.

6)d)i)1 Count Early Repowers/Turnover Towards PM

- 1. Comment:** PM emissions credit should be given for repowering. (CIAQC7) (TA)
- 2. Comment:** By extending credit for early repowers and retirements to the PM BACT requirements, the Board will enable mine operators who have been proactive in replacing and repowering equipment to continue that proactive without installing untested VDECS for our applications prior to them replacing or repowering that equipment. (CALCIMA)
- 3. Comment:** We have spent a lot of money to do early repowers, and we get NOx credit for this in the regulation. But the regulation does not give any PM credit for early repowers. Repowers reduce both NOx and PM emissions, and thus the regulation should give PM credit for them also. (NWS) (NWS3) (NWS4) (SUKUT4)

Agency Response: We acknowledge that the regulation does grant carryover turnover credit toward the NOx requirements but not carryover retrofit credit toward the PM requirements for early repowers. The regulation does give "PM credit" for early repowers in the sense that fleets that replaced high-emitting engines with lower-emitting ones will have a lower PM fleet average and therefore will be closer to meeting the PM fleet average targets. This is an advantage to fleets because fleets that meet the PM fleet average targets do not need to do any mandatory retrofitting. If we also granted carryover retrofit credit, that would allow fleets that still fail to meet the PM fleet average targets the ability to delay applying VDECS in later years, and this would reduce the diesel PM emission reductions achieved by the regulation. Thus, we believe that fleets such as NWS and SUKUT that did early repowers already receive credit in the

regulation in several ways, and – if we granted more credit – that would undermine the emission reductions expected from the regulation.

The topic of PM credit for repowers and other forms of turnover was discussed at both the May and July 2007 Board hearings. The regulation approved by the Board appropriately balances credit to assist fleets in meeting BACT requirements and the need to obtain sufficient emissions benefits.

The public health risk attributed to diesel exhaust and the need for emissions reductions to protect public health are discussed in Chapter IV of the Technical Support Document, and the responses to comments in Chapter 1 of this FSOR.

4. Comment: Vehicles replaced to satisfy the NOx BACT turnover requirements should also count towards the PM BACT retrofit requirement. In addition, credit should be given for vehicles removed from the fleet or designated low-use. (POHLE)

Agency Response: As stated in the above response, the regulation provides credit toward the NOx requirements for the actions listed in the POHLE comment – turning over vehicles, retiring vehicles, and designating vehicles as low-use. If fleets are preferentially turning over and designating as low-use their relatively high-emitting vehicles, then the regulation also effectively provides “PM credit” in the sense that fleets have shifted to lower-emitting engines and will consequently have a lower PM fleet average and be closer to meeting the PM fleet average targets. This is an advantage to fleets because fleets that meet the PM fleet average targets do not need to do any mandatory retrofitting. If we also granted carryover retrofit credit for such actions, that would allow fleets that do meet the PM fleet average targets in later years to delay applying VDECS , which would reduce the diesel PM emission reductions achieved by the regulation.

Believing that turnover is generally more expensive than having to apply retrofits, the Board structured the regulation so that fleets that do not meet the PM fleet average targets do not have to turnover vehicles. Alternatively, the Board could have decided to grant PM credits for vehicle turnovers and require the fleet to turn additional vehicles if PM targets were not met.. Or, it could have decided that if no retrofits were available for a certain engine, fleets would be required to turn vehicles over to make up for the lack of PM retrofit availability. It decided that the least costly option would not be to provide PM credits for vehicle turnover.

As described further in the responses in Chapter 5 of this FSOR, we received many comments stating that the regulation is very complex. Another reason PM credit is not given for retiring, repowering, and designating vehicles as low-use is to avoid increasing the complexity of the regulation. To create additional

calculations, along with accompanying restrictions and exemptions, would add significantly length and complexity to the regulation.

6)d)i)2) This section was intentionally left blank

6)d)i)3) Give More Early Credit for Electric GSE

1. **Comment:** Every effort should be made to ensure that the regulation provides appropriate credit to fleet operators that install or have already installed, electric equipment which emits zero diesel PM and NOx. Every appropriate electric unit should be counted and fully credited, including both units installed to achieve compliance with the regulation, and units installed previously. In particular, fleet operators who have already installed electric should not be effectively punished for achieving early reductions on a voluntary basis. (ATA1)
2. **Comment:** The regulation sets a precedent that would discourage others from voluntarily investing in new emission reduction technology. Diesel-fueled GSE fleets who did not take early emission reduction actions are rewarded for delaying investments until the regulation becomes effective. In its ISOR, ARB neither justifies nor discusses the rationale for arbitrarily eliminating 80 percent of the emission reduction credit associated with electric GSE purchased prior to January 1, 2007. (ENDSLEY)
3. **Comment:** There is a need to maximize credit for existing and new electric GSE. It is important to incentivize the acquisition of electric GSE. (ATA3)
4. **Comment:** Limiting credit for early GSE purchases to only 20 percent is not warranted, particularly where a given airline can demonstrate that more than 20 percent of its electric GSE purchased prior to 2007 replaced or performs work that would otherwise be performed by diesel vehicles, or otherwise should be credited toward compliance with the regulation. (POHLE)

Agency Response: We believe that appropriate credit is given for electric vehicles used for compliance with the regulation. Vehicles with electric motors purchased on or after January 1, 2007, receive double credit between 2010 and 2016, and single credit for 2017 and beyond.

For non-Ground Support Electric (GSE) vehicles purchased prior to January 1, 2007, the Max HP of the vehicle may be used, along with an emission factor of zero, in the NOx and PM fleet average calculators. This allows fleet owners with electric vehicles to gain credit (in the form of lower PM and NOx fleet averages) for their zero emitting vehicles that replaced diesel vehicles that formerly operated in their fleet. However, for GSE vehicles purchased prior to January 1, 2007, a fleet owner can only claim 20 percent of the diesel vehicle's max hp

(using an emission factor of zero) towards the fleet averages and targets for that fleet. This decision was made after reviewing reports from the airlines submitting to ARB during implementation of the South Coast GSE Memorandum of Understanding (MOU), which was a voluntary program to provide reductions in hydrocarbon (HC) and NOx emissions beyond what was required at airports in the South Coast Air Basin. (The MOU was terminated on January 1, 2006.) From the GSE MOU data, staff found that on average, only 20 percent of the electric vehicles purchased was used to replace diesel vehicles; a majority of the purchased electric vehicles were used to replace large spark-ignition vehicles, or existing electric vehicles. Because this regulation addresses the need to reduce emissions from diesel-powered engines, staff did not feel it was appropriate to give credit for electric vehicles that did not result in the direct reduction of diesel emissions.

6)d)i)4) Credit for Commitments

- 1. Comment:** The off-road diesel rule should be modified to give fleet owners greater flexibility in meeting the fleet average targets. Rather than be penalized by a BACT Path, operators should be allowed to cure shortfalls through new equipment purchases. We would ask that for the interim targets in 2010 and 2013 operators be given credit for the commitment to purchase Tier 4 equipment. Absent this requirement, OEMs should be required to introduce Tier 4 equipment by 2010. (CSIA)

Agency Response: We believe the regulation already gives fleet owners great flexibility in finding the most cost-effective compliance path, and for the reasons described below do not agree that the regulation should be modified as suggested.

Giving fleet owners credit for committing to buy Tier 4 vehicles in the future would have the same effect as delaying the first implementation dates until 2014. As described further in the response in section 8)d)i), the regulation's first implementation dates cannot be delayed until 2015, because doing so would forego all the emission and health benefits before 2015 and would fail to achieve emission reductions in a major milestone year for the federally mandated State Implementation Plan (SIP).

Another major problem with allowing credit for a commitment to purchase Tier 4 vehicles would be uncertainty as to whether the fleet owner would follow through on that commitment.

As far as requiring engine manufacturers to produce Tier 4 engines early, the Tier 4 emissions standards for off-road diesel engines were adopted by ARB and U.S. EPA in 2004 after a rulemaking process that considered various timelines for implementation and judged that the Tier 4 timelines included were as aggressive as possible. In addition, reopening the Tier 4 new engine standards is outside the scope of this regulation.

2. **Comment:** The regulation should give fleets credit for purchasing Tier 4 replacements. (ATA3)

Agency Response: We agree and added a provision to do this in the first Notice of Public Availability of Modified Text and Availability of Additional Documents. Section 2449.2(a)(2)(A)1.a. of the regulation, Turnover to Tier 4 In Lieu of Retrofitting, now states that a fleet which acquires Tier 4 engines equipped with factory-installed diesel particulate filters, and also retires older, non-Tier 4 engines, the fleet receives credit towards the BACT PM requirements. Such Tier 4 replacements count in lieu of retrofitting. For this action, the fleet obtains carryover retrofit credit in addition to moving closer to meeting the fleet average emission targets because the fleet is cleaner.

6)d)ii) This section was intentionally left blank

6)d)iii) Give More Credit for Alternative Fuels

1. **Comment:** We request that the alternative fuel section be expanded, more open, and inclusive of future fuel developments. (GLATKY)
2. **Comment:** Why are the only alternatives mentioned usually new equipment or new motors? There are many retrofits available for diesels to run on Natural Gas or Propane that are not that expensive. Why are these not mentioned much? (EARL)

Agency Response: The regulation already gives credit for use of alternative fuels, as described further below.

The ARB maintains a long-standing policy of being “fuel-neutral” for the goal of emissions reductions. The use of different fuels is acceptable, and in some cases encouraged. However, all fuels and the hardware required to utilize these fuels must be covered under either new engine certification and warranty procedures, or aftermarket retrofit certification. The off-road regulation specifically lists natural gas propane, hydrogen, electricity, and other alternative fuels, including the provision for advanced technologies that do not rely on diesel fuel.

Section 2449(d)(1) of the regulation sets forth the credits that fleet owners may receive for using electric and alternative fuel vehicles. See Chapter VII of the TSD, on how electric and alternative fuel vehicles that replace diesel vehicles are counted in calculating fleet averages. Among other things an electric or alternative fuel vehicle that replaces a diesel vehicle must serve same purpose as a diesel vehicle and must be used outdoors. Electric vehicles that are purchased between 2009 and 2016 are counted double in fleet average calculations.

Under section 2449.2(a)(2)(A)1.c. of the regulation, Conversion of Diesel Vehicles to Alternative Fuel, a fleet owner will receive credit for converting a diesel vehicle to alternative fuel such as natural gas or propane (as suggested by comment EARL). Such conversions may be used in meeting the PM retrofit requirements or to accumulate carryover PM retrofit credits.

6)d)iii)1) Give Credit for Natural Gas Conversions

- 1. Comment:** Allow conversion of diesel engines to natural gas, to comply with PM retrofit requirements. (REED)

Agency Response: Staff agrees and changed the regulation to allow credit for alternative fuel conversions in the first Notice of Public Availability of Modified Text and Availability of Additional Documents. Section 2449.2(a)(2)A.1. now reads “Conversion of Diesel Vehicles to Alternative Fuel - Fleets that convert a diesel vehicle subject to the regulation to alternative fuel may count the max power of the vehicle converted toward the required hp to be retrofit under section 2449.2(a)(2)(A)1. or to accumulate carryover PM retrofit credit.”

6)d)iv) Give More or Less Credit for Electric Vehicles

- 1. Comment:** The regulation allows fleet owners to include an electric vehicle in their fleet if the owner can demonstrate such vehicle serves a function and performs the work equivalent to that of diesel vehicles and is used for a purpose for which diesel vehicles are predominantly used. ARB's insertion of the term “predominantly” is problematic and should be revised.

First, the term predominantly is ambiguous and not defined by ARB in the regulation. Thus, this term could be interpreted by ARB and GSE fleet owners in a number of different and conflicting ways. Second, ARB's use of the term predominantly may create a disincentive for GSE fleet owners to replace a diesel vehicle with an electric unit. As ARB is aware, many of the same airline ground support functions can be performed by both LSI and diesel-powered vehicles. By creating an ambiguous and undefined predominance test, ARB's regulation discourages GSE fleet owners from adding electric units to their fleets, even if the electric unit is in fact replacing a diesel vehicle. In the context of GSE, where diesel vehicles may be substituted for electric units, the application of a predominance test is contrary to ARB's policy of encouraging the use of electric units. There is simply no justification for ARB to limit electric vehicle replacements to GSE units used for a purpose for which diesel vehicles are predominantly used. United recommends that ARB modify this requirement and adopt the approach used in ARB's LSI Rule. Specifically, ARB's regulation should allow fleet owners to take credit for electric-powered vehicles in their fleet average if the fleet owner can demonstrate

that the vehicle performs the work equivalent of a diesel-fueled vehicle.
(ENDSLEY)

2. **Comment:** While the regulation allows credit for electric equipment based on the horsepower (HP) of any diesel vehicle that it replaced, it provides inadequate credit for new electric equipment that is added and does not “replace” and identifiable existing diesel vehicle. For such “new” electric, the regulation requires using the HP of the electric motor – a figure which is essentially meaningless, usually not readily available to the end-user, and not comparable to the HP ratings given to internal combustion engines. The regulation should provide credit for all electric GSE based on the average HP of all diesel GSE in a given category (which is consistent with the approach taken by ARB in its recently-adopted regulation of large spark-ignition GSE), or using other reasonable default values that assign an HP figure to electric that is similar to the HP rating of a comparable diesel vehicle. (ATA1) (POHLE)

Agency Response: We agree that the regulation should give credit for electric vehicles that perform equivalent work of diesel vehicles. Section 2449(d)(1)(A)3.a., which addresses electric vehicles purchased on or after January 1, 2007 reads as follows:

“For an electric vehicle that replaced a diesel vehicle in the owner’s fleet, the maximum power of the diesel vehicle replaced may be used as the electric vehicle’s Max Hp. For an electric vehicle added to the fleet, the fleet owner may apply to the Executive Officer to use the maximum power of a diesel vehicle that serves the same function and performs equivalent work to that of the electric vehicle. In making his or her determination, the Executive Officer will approve the use of the minimum Max Hp of a diesel vehicle that would be required to perform the same functions and equivalent work. If no request to the Executive Officer is received, the electric vehicle’s own maximum power rating should be used.”

We believe the predominance test mentioned by commenter ENDSLEY is necessary. A fleet owner must be able to demonstrate that an electric vehicle serves a function and performs the work equivalent to that of diesel vehicles and is used for a purpose for which diesel vehicles are predominantly used in order to count that vehicle in the fleet average. If we did not limit the credit to vehicles that are used for a purpose for which diesel vehicles are predominantly used, then the regulation might give fleets credit for electric vehicles that are not replacing diesel vehicles (i.e., electric vehicles that would have been used anyway or that are replacing spark ignition vehicles). This would subvert the purpose of the regulation, which is to reduce emissions from in-use off-road diesel vehicles. Giving too much credit for electric vehicles could “dilute” the effectiveness of the regulation by allowing fleets to continue operating dirty diesel

vehicles which are offset by clean electric vehicles that would have been operated even in the absence of the regulation.

The issue of how to credit electric GSE purchased prior to January 1, 2007, is addressed further in the response in section III-A-6)d)i)3) of this FSOR.

3. Comment: Electric and Alternative Fuel Vehicles and Systems Used to Replace Diesel Vehicles - Delete credits for electric ground support equipment (GSE) to avoid any possible overlaps with existing and future regulations. Credits for GSE electrified prior to or after 2007 are already taken into account in the previous memorandum of understanding (MOU) with the airlines and/or included in CARB's large spark-ignited (LSI) regulation. Also, as indicated in CARB's latest SIP state strategy, there are additional opportunities for GSE electrification (beyond CARB's existing large spark ignition (LSI) regulation) which should be investigated for future controls, and therefore, any electric GSE after 2007 should not be double credited under the off-road diesel equipment regulation.
(SCAQMD1)

Agency Response: We disagree. The regulation includes credit for electric GSE in order to provide an incentive for owners of GSE to convert from diesel to electric GSE. As the commenter notes, there are opportunities for GSE electrification and the regulation needs to encourage airlines to pursue those opportunities.

The regulation in section 2449(d)(1) already contains provisions to ensure that any electric vehicle credited in the fleet average is actually replacing a diesel vehicle and therefore reducing emissions of diesel PM, and to ensure that the vehicle is not already double counted in ARB's existing LSI regulation. In order for an electric vehicle to be counted in the fleet average, the owner must demonstrate the following:

- The vehicle serves a function and performs the work equivalent to that of diesel vehicles and is used for a purpose for which diesel vehicles are predominantly used,
- The electric or alternative fuel vehicle is used predominantly outdoors, and
- The electric or alternative fuel vehicle is not already included in the fleet average emission level requirements for LSI engine fleets in title 13, Section 2775.1.

Electric GSE purchased before January 1, 2007 is only credited at 20 percent of its horsepower in the fleet average because the reporting data submitted to ARB as part of the MOU indicated that 20 percent of electric GSE acquired before that date had actually replaced diesel GSE.

As discussed in the response in section III-A-6)d)iv) of this chapter of this FSOR,

some airlines who own GSE believe we did not allow enough credit for electric GSE. We believe the regulation allows enough credit for electric GSE to provide an incentive for airlines to pursue electrification without inappropriately giving credit for electric GSE that does not actually offset diesel emissions.

6)d)v) Give Credit for Tier 1 Repowers

- 1. Comment:** I am appalled that most of the Carl Moyer funded projects that have been performed under this program to re-power equipment from unregulated Tier 0 engines to Tier 1 engines are not even recognized by CARB in the regulation. (ECC05)

Agency Response: The goal of the regulation is reduce emissions. When a fleet performs any action that reduces the emissions from their vehicles, the fleet moves closer to meeting fleet average emission targets. Also, the regulation grants carryover turnover credit for Tier 1 repowers performed prior to March 1, 2009. Thus, fleets that do Carl Moyer funded projects involving Tier 1 repowers completed prior to March 1, 2009 get credit under the regulation in two ways – first, their fleet averages are closer to their fleet average targets, and, second, they receive carryover turnover credit which they can use to meet the BACT turnover provisions in a future year. This lower fleet average and early credit means the fleet will have lower compliance costs later. For an additional discussion on the early credit provisions, please see the response in section III-A-6)d)i) of this FSOR.

Another advantage fleets that have repowered to Tier 1 receive is that all vehicles with a Tier 1 or higher engine are exempt from the turnover requirement until March 1, 2013.

After March 1, 2009, repowering with a Tier 2 engine or higher is required to get carryover turnover credit. If a fleet repowers with Tier 1 engines after March 1, 2009, the tier 1 engines will not meet the fleet average targets, and the fleet will therefore not be making sufficient strides in complying with the fleet average targets.

It should be noted that public funding (Carl Moyer program, and others) has paid for the repowering of public and private off-road vehicles. The Carl Moyer program has funded over 300 off-road vehicles such as scrapers, wheel loaders, compactors, tractors, excavators, and rough terrain forklifts. The Carl Moyer-funded vehicles have cleaner engines, therefore fleets with such vehicles are closer to meeting fleet average targets and will have to take less action in the future. The fleets that have received public funds will have obtained this benefit without expending funds from out of pocket.

6)d)vi) Give Credit for Gasoline Powered Replacement Vehicles

- 1. Comment:** Emissions reduction credit should be provided when “old” diesel GSE are replaced by “clean” large spark-ignition GSE. (ATA1) (ATA3) (POHLE)

Agency Response: We agree. We made this change in the first Notice of Public Availability of Modified Text and Availability of Additional Documents by adding section 2449(d)(1)(D) Gasoline-Powered Vehicles Used to Replace Diesel Vehicles. This section describes the conditions that must be met for a gasoline-powered vehicle of 25 hp or greater used to replace a diesel-powered vehicle on or after January 1, 2007 to count in the fleet average. The conditions include that the gasoline vehicle was added to the fleet within six months from the retirement of the diesel vehicle, and the gasoline vehicle replaced the diesel vehicle. The fleet must remain in compliance with the large spark-ignition fleet regulation if that gasoline vehicle is excluded from the large spark-ignition average. In addition, the gasoline-powered vehicle must be certified to a NOx standard less than or equal to the diesel Tier 1 standard for the same horsepower, and also certified to a NOx standard less than or equal to the diesel standard for the same model year and horsepower.

6)d)vii) Intentionally left blank

6)d)viii) Give Credit for Level 1 VDECS

- 1. Comment:** The regulation should give credit for Level 1 (DOC) or Level 2 devices for up to five years, after which a vehicle would need to be retired or a Level 3 device installed. Operators with lower-use machines should be given credit for retrofitting existing machines with Level 1 or Level 2 devices. Level 1 and Level 2 devices are much less expensive than Level 3 devices. Level 1 devices do not have potential regeneration issues, are usually easier to install, won’t obstruct the operator’s field of vision, and less likely to be damaged by vibration. (GLATKY)

Agency Response: The mandatory retrofit provisions for PM BACT require the use of the highest level verified device. Staff structured the regulation to not provide credit for Level 1 devices because they do not reduce PM emissions as effectively (by only 25 percent) as Level 2 devices, which reduce emissions by 50 percent and Level 3 devices, which reduce emissions by at least 85 percent. Reductions of less than 50 percent do not reduce emissions sufficiently in light of available technology.

However, the regulation does give credit for Level 2 devices, which are credited as a 50 percent PM reduction, under the fleet average provisions. Thus, the use of Level 2 devices can be part of a fleet’s compliance strategy, so long as the fleet is meeting the PM fleet averages which allow a fleet to employ higher-emitting engines along with cleaner engines, as long as the average meets the fleet average targets.

In all cases, the regulation exempts retrofitting an engine if a retrofit impairs the safe operation of the vehicle as demonstrated per section 2449(e)(8). If a retrofit cannot be safely installed or is not appropriate for a particular application, then the diesel emission-control strategy manufacturer and authorized diesel emission-control strategy dealer may make a determination that it cannot be used on a specific engine. In such an event, the retrofit will not be considered the highest level VDECS.

6)d)ix) More Incentive for Scrapping or Upgrading Vehicles

- 1. Comment:** We feel it would be worth investigating some manner of incentive, whether through grants, relaxed fees, or regulatory credit, for scrapping or upgrading vehicles to be sold. Doing so would make the regulation more affordable for the industry while reducing pollution not just in the State, but out-of-state as well. (HCC)

Agency Response: On March 27, 2008, the Board approved updated Carl Moyer Program Guidelines that included provisions for the replacement of off-road vehicles. This program will provide grants for the replacement of uncontrolled, fully-functioning off-road vehicles with new or used current tier vehicles. While Carl Moyer Program funds cannot be used for regulatory compliance, funds may be available projects completed at least three years prior to the compliance dates of the regulation or for actions that go beyond regulatory compliance, such as NOx reductions for small fleets.

Also, the regulation gives fleets credit for retiring vehicles (which counts as turnover) and for upgrading vehicles (i.e., installing retrofits on them, repowering their engines, or rebuilding their engines to a higher standard). This credit may be applied in a future years to assist in meeting BACT requirements.

See also the responses in section III-A-6)e)i) for further discussion of making the regulation more affordable with incentive funding.

6)d)x) Do Not Require Fleets to Retire Tier 0 Vehicles First

- 1. Comment:** Please change 2449(d)(3) of the regulation to read:

“Order of turnover – All engines in a fleet that were not subject to a PM standard for new engines (Tier 0 and Tier 1 with no PM standard, i.e., Tier 1 engines between 50 and 174 horsepower) must be turned over before turnover of any other higher tier engines may be counted toward the turnover requirements in 2449(d)(2)(A) or toward accumulating carryover turnover credit unless it meets the criteria below.

The fleet is calculating its index pursuant to 2449(d)(1)(D) and can demonstrate that the turnover it made decreased their PM and NOx emissions more than replacing the engine not subject to a PM standard.”

We do not believe this change should be controversial as it is only available to a fleet in limited circumstances and only when the decision made by the fleet manager has a positive emissions reduction benefit which will clearly be evident in their inventory. It will allow fleets to temporarily bypass support equipment that serves a limited hour function that exceeds the hours of use requirement for a low-use piece of equipment that when weighted for hours of use still emits less than other high use equipment an operator may desire to turnover earlier in order to reach the fleet average sooner. (CALCIMA)

Agency Response: We do not believe the addition proposed above should be made because it would increase the complexity of the regulation and because the regulation already gives fleet owners sufficient flexibility to choose a cost-effective compliance path.

Fleet owners already have the ability to choose to keep Tier 0 engines and retire higher tier engines to meet the fleet average under 2449(d)(1)(D). Fleets that meet the fleet averages do not have any order of turnover requirements. Fleets may also choose to use the Hours in Fleet Average option, which allows their higher use vehicles to count more than relatively low use vehicles in their fleet average.

On the other hand, fleets that do not meet the fleet averages and instead use the BACT path to comply with the regulation do have an order of turnover requirement. This order of turnover requirement is in place to ensure that fleets that fail to meet the fleet average targets address their dirtiest, highest polluting vehicles first.

We received many comments stating that the regulation is very complex. In the regulation, we tried to balance regulation complexity against flexibility for unique and unusual circumstances, to avoid increasing the complexity of the regulation. To create additional calculations, along with accompanying restrictions and exemptions, would add length and complexity to the regulation. Allowing fleets to demonstrate that turning over another vehicle would decrease emissions more than turning over the required vehicle would be equivalent to allowing fleets to submit an Alternative Compliance Plan. See the response in section III-A-6(k)(vii)3) of this FSOR regarding why the Board did not include Alternative Compliance Plan provisions in the regulation.

It is also important to note there are exemptions to protect certain vehicles from mandatory turnover. A specialty vehicle is exempted from mandatory turnover if

a fleet performs certain actions. “Specialty vehicle” is defined in the regulation as a vehicle for which no used vehicles with cleaner engine that can serve an equivalent function or perform equivalent work is available. These actions include:

- i. The fleet has turned over all other vehicles that are required to be turned over,
- ii. No repower is available for the specialty vehicle, as demonstrated to the Executive Officer,
- iii. A used vehicle with a cleaner engine is not available to serve a function and perform the work equivalent to that of the specialty vehicle, as demonstrated to the Executive Officer, and
- iv. The specialty vehicle has been retrofit with highest level VDECS.

Also exempt from mandatory turnover are vehicles that have been retrofitted within the last six years with a level 2 or 3 VDECS that was highest available at the time of installation. Retirement of vehicles with Tier 1 engines or higher is exempt from mandatory turnover until March 1, 2013, provided that all Tier 0 vehicles that do not qualify for an exemption have been retired.

We feel that these exemptions provide sufficient flexibility for fleets without increasing the complexity of the regulation.

6)d)xi) Count Retirement for PM and NOx BACT Requirements

1. **Comment:** We propose a true “safety valve,” one that in lean years would allow a fleet to retire 12% (150 % of the required turnover rate) of their horsepower, rather than repower or replace with compliant equipment. The 12% retirement would exempt the equipment owner from the exhaust retrofit requirement that year. (RTC)

Agency Response: We agree that fleets that are facing lean financial times and shrinking should have a way to comply with the regulation without purchasing retrofits or paying to repower vehicles. The Board debated this issue at the July 26, 2007, hearing and directed staff to provide PM retrofit credits – to the extent that it can be done without a significant loss of emissions benefits – to fleets that retire Tier 0 vehicles while reducing their total horsepower. In the first Notice of Public Availability of Modified Text and Availability of Additional Documents, we added this new provision in section 2449.2(a)(2)(A)1.b., Retirement of Tier 0 Vehicles in Lieu of Retrofitting for Fleets with Reduced Horsepower. Under section 2449.2(a)(2)(A)1.b., if a fleet retires 20 percent of its horsepower and its total horsepower shrinks 20 percent in a year, then it has complied with all BACT requirements and does not need to do any further retrofitting or turnover that year. If we had allowed fleets to avoid the BACT requirements by retiring 12 percent as requested in the RTC comment above, that would have foregone emission benefits and therefore would not have complied with the direction of the Board.

6)d)xii) This section was intentionally left blank

6)d)xiii) Credit New Vehicles in Hours in Fleet Average Option

1. **Comment:** The formula in the Hours in Fleet Average Option section allows potentially no credit for brand new engines added to the fleet. Suppose a piece of equipment that is heavily used is retired on March 1 and replaced with a new much lower emitting piece of equipment. The hourly weighted approach provides credit for the retirement but no credit for the new unit. (ARA2)

Agency Response: We acknowledge that this is true; however the hours in the fleet average option in section 2449(d)(2) is just that, an option, and is not a mandatory route to compliance. As noted by the commenter, for fleets that choose to use the hours in fleet average option, during the first year of reporting, new vehicles that have only just begun to be used will not be heavily weighted in the calculated indices (because they will not have many hours). However, in subsequent years, if such vehicles are heavily used, they will be heavily weighted. For further explanation of the hours in fleet average option and why it was structured as it was, please see the response in section III-A-6)k)vii)2) of the FSOR.

6)e) Funding

6)e)i) Fund Regulation More Fully with Incentive Monies

1. **Comment:** ARB should continue to establish and support grant funding to help fleets offset compliance costs of the regulation. Compliance costs will extend beyond the time that fleets will have access to current funding programs resulting in several years where fleets will have little or no access to funding to help with compliance costs. (LACITY)

Agency Response: ARB does not have the authority to establish additional grant programs; this authority lies with the California Legislature. We agree that compliance costs will extend beyond the time fleets have access to current funding programs, such as the Carl Moyer Program. The Carl Moyer Program is intended to fund actions that go beyond what is required by regulation. It does not provide grants to assist with regulatory compliance unless actions are taken a minimum of three years prior to compliance deadlines.

2. **Comment:** The state should purchase older equipment from fleet owners at fair market value to remove the equipment from the in-use fleet. These purchases should be financed through grant funds or through raising taxes. (CDTOA1)(ECCO2)

Agency Response: There is currently no funding program available to purchase older equipment from fleet owners. ARB does not have the authority to establish

additional grant programs or levy taxes; this authority lies with the California Legislature.

3. **Comment:** Incentive funds will not be available to help large GSE fleets comply with the interim compliance targets of the regulation. (ENDSLEY)
4. **Comment:** The Carl Moyer Program should be expanded to allow small and medium contractors to qualify and participate in the program. (CBCC2)
5. **Comment:** Incentive funding programs for off-road equipment should be expanded and restructured in such a way that will allow small contractors who were unable to participate in past incentive programs to help meet the cost demands of retrofitting equipment. CARB should endorse a tax credit scheme for retrofits, repowers and replacement equipment. (CIAQC7)

Agency Response: The Carl Moyer Program currently has about \$140 million available each year statewide until 2015 for which eligible projects must compete for funding. Eligible projects include on-road, agricultural pump, marine, locomotive, as well as off-road projects. Emission reductions funded through the Carl Moyer Program are credited in California's State Implementation Plan and must be real, surplus to regulatory requirements, quantifiable, and enforceable. In addition, projects must meet a cost-effectiveness threshold defined in state law and adjusted by the ARB based on inflation. In general, there are no limitations as to the size of the fleet, or size of the business, that can apply for funding (small, medium, or large), but eligible projects from all sized fleets and project categories are competing for limited funding available every year. Any modifications to the above criteria would require a legislative change to the statute that governs the Carl Moyer Program.

To ensure that Carl Moyer Program funded emission reductions are surplus to regulatory requirements, the program has established a minimum three year project life. This means that the incentive funds cannot be used to pay for equipment that is less than three years from its compliance dateline. As described in the Chapter XII, Section E of the Technical Support Document, large fleets have very limited Carl Moyer funding available due to the early compliance deadlines of the regulation. Medium fleets have funding available for projects installed and in operation up until February 28, 2010 after which funding opportunities become very limited. Small fleets are eligible for the incentive funds to pay up to the full cost of retrofits installed and in operation up until February 28, 2012 after which funding opportunities for retrofits become limited. With addition of the Surplus Optional Opt-in for NOx Program (SOON), Carl Moyer funds may be available to assist fleets in meeting the 2014 compliance dates early which would offset the total costs of the regulation for fleets.

The SOON program is described further in the responses in Chapter III-A-9 of this FSOR.

- 6. Comment:** Retrofit kits should be simple, affordable, and subsidized if necessary. (PINETTE1)

Agency Response: With advances in technology and as more kits become available to consumers it is likely that the kits will become simpler and more affordable. As discussed in Chapter VII, Section L of the Staff Report and Chapter XII, Section E of the Technical Support Document, the level of funding available for incentives and grants are not sufficient to pay for all the reductions needed by this and other regulations. In addition, as discussed above, current incentive funds cannot be used to subsidize compliance with this regulation unless actions are taken a minimum of three years prior to compliance deadlines.

See also the response in section III-A-3)d)ix) of this FSOR regarding the cost of VDECS and how we believe we have accurately included that cost in the cost estimates in the Staff Report and Technical Support Document.

- 7. Comment:** If the ARB has no incentive money to help small businesses comply, how are they going to fund inspectors and staff to file the necessary paper work, file complaints and fines? (BENTE)

Agency Response: The funding for incentive programs comes from a different part of the State budget than the funding for ARB operations such as inspectors and administrative staff. For example, the Moyer program is largely funded through the smog check fee, tire fee, and motor vehicle registration fees, whereas ARB operations are funded from different sources. Therefore, the fact that there are insufficient State incentive funds to pay for all compliance costs of small businesses does not indicate ARB will be unable to implement the regulation. On the contrary, ARB is adding staff resources to implement the regulation and has formed a new section to coordinate implementation.

Also, we expect that many small businesses will apply for and receive Carl Moyer incentive funding and structured the regulation to provide extra time for small fleets to be eligible for incentive funding. The availability of incentive funds is based largely on the size of the fleet, not on the size of the business; however, small businesses tend to have smaller fleets. As described in Chapter XII, Section E of the Technical Support Document, small fleets have until February 28, 2012 to receive Carl Moyer Funds for installing VDECS after which funding becomes limited. Small fleets will continue to be eligible for funding of projects achieving NOx reductions.

- 8. Comment:** The state should allocate \$200 Million per year for the Carl Moyer Program or a Carl Moyer-type program to lessen the economic impact of the regulation. (SCOTTR) (CRS) (NNC) (EUCA1)

Agency Response: ARB does not have the authority to establish additional grant programs or allocate additional funds to existing programs; this authority lies with the California Legislature.

The Carl Moyer Program currently has about \$140 million available each year statewide until 2015 for which eligible projects must compete for funding. Eligible projects include on-road, agricultural pump, marine, locomotive, as well as off-road projects. State law requires that emission reductions funded through the Carl Moyer Program be surplus to any regulatory requirement, therefore, without a legislative change Carl Moyer Program funds cannot be used to pay for regulatory compliance unless the projects are completed at least three years prior to the compliance dates of the regulation.

9. Comment: Tax breaks or incentives are needed to help fleets comply. (EUCA3)

10. Comment: Carl Moyer funding needs to remain available and other financial assistance needs to be found. (PCCA) (VCE1) (DER6)

11. Comment: CARB should provide financial assistance and/or incentives to minimize the financial impact to the privately held construction companies impacted by the regulation. Current state, like the Carl Moyer Program, and local programs should be expanded or modified to address the funding needs of the private companies in the early years of the regulations. (SHANAHAN)

12. Comment: Insure that this regulation includes some sort of funding mechanism to aid those companies that will be hit the hardest under this regulation. (ECCO5)

13. Comment: More public funding is needed. We must have a public funding mechanism, such as the Carl Moyer Program to fund at least 80 percent of the cost of compliance. (DER1)

14. Comment: Additional grant opportunities must be made to fleet owners to assist in funding the necessary retrofits and fleet turnover. For example, there needs to be increased funding in the Carl Moyer Program guidelines to fund emission reductions in this class of vehicles. (B36SVAPCC)

15. Comment: It is vital to keep the Carl Moyer funding going. (CAMARILLO5)

16. Comment: The state should develop programs like Carl Moyer in the future as a cost-effective means for achieving emission reductions. (SUKUT2)

- 17. Comment:** If you want to do something, create incentives, avoid regulation. (JANSSON)
- 18. Comment:** We need a funding mechanism to help offset these costs. (ECCO6)
- 19. Comment:** ARB should help create a Carl Moyer type program to help fleets comply with this rule. (B45TA)
- 20. Comment:** More funding is needed. There is not enough Moyer money to do all the equipment repowers required by the proposed rule. (HBE)
- 21. Comment:** For the construction industry, the costs of retrofitting equipment are prohibitive, and financial assistance is therefore needed to facilitate such work. (PILCONIS) (AGCA3)
- 22. Comment:** Funding must be available throughout the process to make the high cost of this regulation more affordable. (B18QC)
- 23. Comment:** Tax incentives/credits should be given: If any other credits could be made, for scrapping or over-achievement to ease the pain would be helpful. (EDC-DOT)
- 24. Comment:** We strongly recommend that public funding such as the Carl Moyer Program be made available on a targeted basis to affected fleets to assist in implementation of the proposed regulation. (SCAQMD1) (SCAQMD2)
- 25. Comment:** More incentive money is needed. A more robust Carl Moyer-type program needs to be in place through 2020 or companies will be unable to fund the capitol requirements dictated by the rule. Stronger incentive and carry-over credit programs should be in effect immediately. (RJB2)
- 26. Comment:** I am suggesting that ARB figure out the cost of the regulation, make a tax out of it and spread it over all the people in the state because all the air breathers are getting the benefit. I think you have to work out the funding better. (BALALA)
- 27. Comment:** Funding should be available for compliance with the regulation. Rather than introducing the initial burden of cost directly onto industry, the cost of the regulation should be taken from the economy directly. The Carl Moyer Program has proven how effective this method is. This method would be embraced by industry, would make the regulatory process easier, and would lessen the industry fear of losing

their business by complying with the law. Even if the regulation is paid for by California as a whole, it will still cost the industry quite a bit. The costs associated with time spent on retrofitting, replacing, and maintaining new equipment types will cost projects a great deal of money and may lead to liquid damages. (HCC)

Agency Response: ARB does not have the authority to establish additional grant programs, increase funding to existing grant programs, levy taxes, or grant tax credits or breaks. This authority lies instead with the California Legislature. See also the responses in section III-A-6)e)ii) of the FSOR for a further discussion of tax credits and tax breaks.

Even with additional and existing grant funding, as discussed in Chapter VII, Section L of the Staff Report and Chapter XII, Section E of the Technical Support Document, the level of funding available for incentives and grants are not sufficient to pay for all the reductions needed by this regulation and other regulations. ARB estimates that the average annual cost of the regulation will be \$243 million (Chapter VIII, Section A of the Staff Report) with the Carl Moyer Program currently receiving up to \$140 million statewide annually to fund on-road, agricultural pump, marine, locomotive, as well as off-road projects. While this money is limited, Carl Moyer Program funds are available for smaller fleets and medium and large fleets that comply with the regulation early. State law requires that emission reductions funded through the Carl Moyer Program be surplus to any regulatory requirement, therefore, without a legislative change Carl Moyer Program funds cannot be used to pay for regulatory compliance unless the projects are completed at least three years prior to the compliance dates of the regulation. As described in the Chapter XII, Section E of the Technical Support Document, large fleets have very limited Carl Moyer funding available due to the early compliance deadlines of the regulation. Medium fleets have funding available for projects installed and in operation up until February 28, 2010 after which funding opportunities become very limited. Small fleets are eligible for the incentive funds to pay up to the full cost of retrofits installed and in operation up until February 28, 2012 after which funding opportunities for retrofits becomes limited. With addition of the Surplus Optional Opt-in for NOx Reductions program, Carl Moyer funds may be available to assist fleets in meeting the 2014 compliance dates early which would offset the total costs of the regulation for fleets.

We acknowledge that the cost of the regulation will be significant for some affected fleets. See also the responses in section 3)a) of Chapter III-A-3 of this FSOR for a discussion of why we believe the regulation will be affordable.

28. Comment: Incentives should be provided for the use of electric equipment. (WATKINSON)

Agency Response: The Carl Moyer Program includes incentives for the purchase of electric equipment in the eligible project categories. In addition, as defined in Section 2449(d)(1), the regulation allows fleets to take credit for electric equipment provided that the fleet can demonstrate that the equipment replaces mobile diesel vehicles.

29. Comment: CARB needs to consider financial subsidy programs to assist fleets impacted by the regulation. The state should consider low or no-interest loan programs to provide financial aid equally to both small and large businesses. We hope that engine manufacturers along with state government would support subsidies and no-interest loans. (CDTOA2)

30. Comment: Consider financial aid and financing for the implementation of this regulation. (MCCLAUGHLIN) (SPR)

Agency Response: Loans may be an appropriate financial avenue to assist fleets impacted by the regulation. ARB believes that loan programs would complement the existing grant and incentive programs well and may provide additional long-term renewable sources of funding to help achieve California's air quality goals. Currently, ARB does not have the internal infrastructure to establish a loan program nor does it have a secured funding source to support such a program. As Proposition 1B funding generally focuses on grants for projects that operate in the goods movement sector, it is unlikely that funding for off-road equipment subject to this regulation will be available. However, ARB is currently developing a limited scale pilot loan program and investigating the feasibility of a larger statewide comprehensive loan program. The pilot program is intended to be available to the public this summer.

ARB agrees that all size fleets should be eligible to compete for public subsidies and does not limit any of its current incentive funds to any particular fleet size. However, ARB does acknowledge that current legislative and local restrictions on certain funding programs make it difficult for small businesses to access incentive funds.

See also the response in section III-A-6)e)x) of the FSOR for a discussion of low interest loan program that may assist fleets in compliance with the regulation.

31. Comment: Financial incentive programs should be made available, in addition to time credits, to contractors who have been proactive with updating their equipment before the regulation requires. Small and large companies alike will face difficulties in meeting the financial demands of the regulation. (ECA)

Agency Response: As discussed in the Chapter IV, Section S of the staff report, the regulation provides several credits for fleets that have been proactive with updating their fleet before prior to the compliance dates in the regulation.

For fleets that will be complying with the BACT requirements of the regulations, credits are provided for early repowers prior to March 1, 2009, early retirement at an average rate greater than 8 percent per year between March 1, 2006 and March 1, 2009, and early retrofits installed prior to March 1, 2009 as described in sections 2449.1(a)(2)(A)2. and 2449.2(a)(2)(A)2. of the regulation. In addition, small fleets are only subject to the PM requirements of the regulation and have an extended initial compliance date of March 1, 2015.

ARB does not have the authority to establish additional grant programs or increase funding to existing grant programs; this authority lies with the California Legislature. State law requires that emission reductions funded through the Carl Moyer Program be surplus to any regulatory requirement, therefore, without a legislative change Carl Moyer Program funds cannot be used to pay for regulatory compliance unless the projects are completed at least three years prior to the compliance dates of the regulation. As described in the Chapter XII, Section E of the Technical Support Document, large fleets have very limited Carl Moyer funding available due to the early compliance deadlines of the regulation. Medium fleets have funding available for projects installed and in operation up until February 28, 2010 after which funding opportunities become very limited. Small fleets are eligible for the incentive funds to pay up to the full cost of retrofits installed and in operation up until February 28, 2012 after which funding opportunities for retrofits becomes limited. With addition of the SOON Program (section 2449.3), Carl Moyer funds may be made available to assist fleets in meeting the 2014 compliance dates early which would offset future costs of the regulation for fleets.

Please see also the responses in section 3)a) of Chapter III-A-3 of this FSOR for a discussion of why we believe companies will be able to meet the financial demands of the regulation.

32. Comment: Give incentives for buyers to upgrade equipment. (DDGE)

Agency Response: On March 27, 2008, the Board approved updated Carl Moyer Program Guidelines that included provisions for the replacement of off-road equipment. This program will provide grants for the replacement of uncontrolled, fully-functioning off-road equipment with new or used current Tier equipment. While Carl Moyer Program funds cannot be used for regulatory compliance, funds may be available projects completed at least three years prior to the compliance dates of the regulation or for actions that go beyond regulatory compliance, such as NOx reductions for small fleets.

33. Comment: There are a number of efforts going on, and I think that things are finally starting to gel to help raise additional incentive money. We worked with the Legislature last year to get some budget money and for some construction equipment that was used by public fleets. I know that we've worked this year to try to get some additional budget money in for

that would have allowed some additional Moyer money. That was rejected by the industry. I think, though, that there are other opportunities to find additional incentive money. Some of it may have to have different kinds of rules than Moyer to ensure that some of these very small companies, both in this industry and others, have access to money longer. (ENVDEF3)

Agency Response: In Fiscal Year 2006-2007, ARB was appropriated \$25 million to provide grants to public agencies to purchase low-polluting construction equipment. ARB has committed all \$25 million in funds for the replacement, retrofit, or repower of 305 pieces of equipment. This appropriation has not been renewed in later fiscal years.

On October 13, 2007, the Legislature and the Governor approved Assembly Bill (AB) 118 (Statutes of 2007) providing \$200 million a year to create and implement three new programs to fund air quality improvement projects as well as develop and deploy technology and alternative and renewable fuels. Of the \$200 million, approximately \$50 million will be administered by ARB under the Air Quality Improvement Program (AQIP). AQIP will provide funding for Moyer-like projects (including off-road), evaporative emission controls, emerging hybrid technologies, and lawn and garden equipment.

34. Comment: At this point there is no Carl Moyer Program funding available for companies like us. We have 80 applications in and none of our applications have been selected for funding. There are so many applications that it would be April before our name would come to the top of the list. (DER7)

35. Comment: I have applied to participate in a funded air quality assistance program: however I am told that funds have already been depleted. (EEI)

36. Comment: We have supplied data to show the difficulty that Camarillo Engineering is having in securing current Carl Moyer money for a variety of reasons. (CAMARILLO6)

Agency Response: As discussed above and in Chapter VII, Section L of the Staff Report and Chapter XII, Section E of the Technical Support Document, the level of funding currently available for incentives and grants are not sufficient to pay for all the reductions needed by this regulation. ARB estimates that the average annual cost of the regulation will be \$243 million (Chapter VIII, Section A of the Staff Report). The Carl Moyer Program currently has about \$140 million available each year statewide until 2015 for which eligible on-road, agricultural pump, marine, locomotive, and off-road projects must compete for funding. Projects are often selected based on the cost-effectiveness of the projects which is a measure of the dollars provided to a project for each ton of covered emission reductions. Historically, the Carl Moyer Program has been oversubscribed,

receiving significantly more requests for funding than available funding. We therefore recognize that, unfortunately, some applicants for Carl Moyer funding will not receive funding.

37. Comment: I'm asking you to put this off so we can get some more Moyer funding. (CER2)

Agency Response: As discussed in Chapter VII, Section L of the Staff Report and Chapter XII, Section E of the Technical Support Document, the level of funding currently available for incentives and grants are not sufficient to pay for all the reductions needed by this regulation. ARB estimates that the average annual cost of the regulation will be \$243 million (Chapter VIII, Section A of the Staff Report) with the Carl Moyer Program currently receiving up to \$140 million annually through 2015 to fund on-road, agricultural pump, marine, locomotive, as well as off-road projects. The regulation contributes to achieving the 2020 goal set forth in the 2000 Diesel Risk Reduction Plan of reducing diesel PM 85 percent from all diesel sources from 2000 baseline levels as well as meeting the goals of California's State Implementation Plan. Postponing implementation of this regulation would adversely impact both of these programs.

6)e)i)1) Fund the SOON Program

1. Comment: We recognize that a local enhancement, the opt-in option, will increase costs for affected fleets. Therefore, last week, our Board's administrative committee, which includes the chairman of our Board and the chair of each of the standing committees at the agency, unanimously agreed to recommend that the Moyer program funding and other public funding totaling \$120 million during a four-year period be set aside to assist fleets affected by the proposed enhancements to the statewide regulation. But only if the proposed enhancements become regulation and they help close the gap in our region between the air quality improvements we've identified and those that we have to have in order to comply with the State Implementation Plan. Thank you, again, for considering our proposed enhancement and for adopting a rule that will provide great and tremendous public health benefits and greater certainty in our ability to comply with federal PM2.5 standards. (SCAQMD5)

Agency Response: We agree that the regulation will have significant public health benefits. At the July 26, 2007, hearing, the SOON program (Section 2449.3) was approved by the Board.

Chapter III-A-9 of this FSOR provides further description of the SOON program.

2. Comment: I ask that your Board today with your decision to approve this rule with the enhancements also direct your staff to commit \$5 million per year to match our contribution to the SOON program. We believe in the Valley we need about \$10 million per year for a total of \$40 million

compared to the South Coast's need of \$120 million. And at this point, we have \$5 million per year from local funds to contribute into that program. Anything more than that would mean that we have to shift and divert expenditures from other sources that reduce emissions into this program and, therefore, we will not see the net benefit in air quality. Therefore, we ask that you direct your staff to come up with that matching fund out of the statewide Moyer program over which your Board has total discretion. You have about \$14 million a year available to you and we ask that, dedicate \$5 million of that to help projects like this in the Valley. And they will have multi-district benefit because the proposal only requires that these operations be in the Valley and to participate in this district only 50 percent of the time, and we will get multi-district benefits. Therefore, we hope for your support on this matter. (SJVAPCD3)

Agency Response: ARB annually retains up to ten percent of state Carl Moyer Program funds to administer a multidistrict solicitation. The program fills a critical niche since projects funded through this solicitation operate in multiple air districts and therefore may have difficulty qualifying for funding in any single air district. This solicitation is managed as a competitive program with the primary criteria for selection being the cost-effectiveness of projects. The competitive nature of the program was confirmed and emphasized in a recent audit by the Bureau of State Audits (BSA) to the Legislature. One of the key recommendations of the BSA audit for ARB was to place a greater emphasis on cost-effectiveness in the multidistrict program. Historically, projects funded through the solicitation have been cost-effective at approximately \$3,000 per weighted ton of pollutants reduced on average. In addition to cost-effectiveness, other criteria, such as ARB and statewide priorities for funding, are taken into consideration when selecting projects. ARB welcomes the submittal of competitive SOON projects by districts that have opted in to the program.

6)e)ii) Tax Credits

- 1. Comment:** Cancel the Carl Moyer program and replace it with an incentive program based on investment tax credits to replace older vehicles. This will allow all contractors access for assistance. (DCCI)

Agency Response: Eliminating the Carl Moyer Program would require a legislative change to the Statute that governs the program, and we believe the program is valuable and beneficial and should not be canceled. In addition, ARB does not have the authority to establish additional grant programs or levy taxes; this authority also lies with the California Legislature.

- 2. Comment:** Create tax legislation to provide incentive to replace older vehicles. This will ultimately reduce the economic burden taxpayers, homeowners, and businesses. (CRS)

- 3. Comment:** Tax credits and financial incentives towards new equipment purchases, retrofits, and repowers would allow contractors to obtain up to date equipment and assist in the overwhelming financial burden of compliance on a consistent. These incentives have a tendency to motivate owners to make purchases that they would not normally make. What better way to spur the economy, take Tier 0 and Tier 1 engines out of service and aid the state in meeting EPA requirements? (MCDONALD)
- 4. Comment:** Compliance with the regulation will represent an enormous expense (somewhere between \$3 and 3.5 billion according to CARB) it is achievable, especially if the state would provide investment tax credits for this air quality improvement technology. (EUCA1)
- 5. Comment:** Offer tax credits or other incentives to contractors that upgrade to equipment. Tax legislation would lessen the financial impact for contractors which replace older equipment with newer, cleaner equipment. (DENHAM) (MAY)

Agency Response: ARB does not have the authority to establish additional grant programs or levy taxes; this authority lies with the California Legislature.

We recognize that incentive programs can be helpful. Helping fund early compliance with the regulation with incentive monies is discussed further in the responses in section III-A-6)e)i) of the FSOR.

As discussed in Chapter VII, Section A, of the Staff Report, we recognize that the regulation imposes significant cost, an estimated \$3 to \$3.4 billion in total.

6)e)iii) Provide Incentives for Manufacturers

- 1. Comment:** The state should offer incentives to the equipment manufacturing industry to provide the best available solutions. (AE)

Agency Response: ARB does not have the authority to establish incentive programs; that authority lies with the California Legislature. ARB already subjects manufacturers of new engines used in off-road equipment to emission standards and other emission-related requirements. As described in Chapter II, Section F of the Staff Report, off-road engine standards, adopted by both U.S. EPA and ARB, have required manufacturers to meet increasingly stringent emission requirements for new off-road engines since the mid 1990's. The most recent tier of engine standards, Tier 3, became effective in 2006, and the next tier, Tier 4, will begin to be implemented in 2008. ARB already subjects VDECS manufacturers to verification standards. As described in Chapter VIII of the Technical Support Document, the VDECS must be demonstrated to be durable and reduce PM emissions among other criteria for verification.

6)e)iv) Regulation Cuts Fleets Off from Funding

- 1. Comment:** The regulation will cut fleets off from Carl Moyer Program. The proposal before the Board is not feasible from an economic or technical perspective and, if implemented, it would also cutoff access to critical funding for retrofitting older equipment under the Carl Moyer Program. (PILCONISAGCA3)
- 2. Comment:** I am concerned that with the implementation of this rule the current funding available through the Carl Moyer Program will no longer be available for re-powering older construction engines. Under the proposed rule, the industry would lose access to these funds almost immediately. While these funds will not make a significant dent in meeting the fleet emission targets under the proposed rule, they are nonetheless an important and essential tool in improving air quality. (MARGETT)
- 3. Comment:** Due to the early compliance dates for large and medium fleets, one could argue that these fleets would no longer be eligible for Moyer funding. (CBIA)

Agency Response: Emission reductions funded through the Carl Moyer Program are credited in California's State Implementation Plan and must be real, surplus to regulatory requirements, quantifiable, and enforceable. Therefore, state law requires that Carl Moyer Program funds cannot be used to pay for regulatory compliance. Any modifications to the above criteria would require a legislative change to the Statute that governs the Carl Moyer Program.

We acknowledge that the regulation will mean some actions that were eligible for Carl Moyer Program funding in the past will no longer be eligible. To ensure that Carl Moyer Program funded emission reductions are surplus to regulatory requirements, the program has established a minimum three year project life. This means that the incentive funds cannot be used to pay for equipment that is less than three years from its compliance dateline. As described in the Chapter XII, Section E of the Technical Support Document, large fleets have very limited Carl Moyer funding available due to the early compliance deadlines of the regulation. Medium fleets have funding available for projects installed and in operation up until February 28, 2010 after which funding opportunities become very limited. Small fleets are eligible for the incentive funds to pay up to the full cost of retrofits installed and in operation up until February 28, 2012 after which funding opportunities for retrofits becomes limited. With addition of the Surplus Optional Opt-in for NOx Program, Carl Moyer funds may be available to assist fleets in meeting the 2014 compliance dates early which would offset future costs of the regulation for fleets.

- 4. Comment:** We're a mid-size general engineering contractor that, up until April, was in the mid-size category. But when that category got moved from 20,000 horsepower down to 5,000 horsepower, we're sitting at about

12,000 to 13,000 horsepower. I want to answer a couple things that the Board members brought up today. I heard the words "level playing field," being the ability to pass on the costs, triennial observation, triennial example, and job loss. Whenever you have steps in a plan, it's not level. It's not a level playing field; it's got steps in it. So, for example, for my company, we compete about 70 percent of the time with what is now still the medium-size fleet, under 5,000 horsepower. But they have Carl Moyer funding available to them for several years, of which we have no funding available to us. And then I also heard in testimony today about a new option of a SOON program for those districts that are out of attainment. And I think that sounds great conceptually. But if you think about, there's a program for the 20,000 and up. There's a program for the 5,000 and under. That's leaving the companies of my size, the 5,000 horsepower to the 20,000 horsepower, with no options for subsidized funding what over. (RTC2)

Agency Response: As described in the Chapter XII, Section E of the Technical Support Document, medium sized fleets have funding available for projects installed and in operation up until February 28, 2010 after which funding opportunities become very limited as with large fleets which have very limited Carl Moyer funding available due to the early compliance deadlines of the regulation. With addition of the Surplus Optional Opt-in for NOx (SOON) program (section 2449.3), Carl Moyer funds may be available to assist fleets in meeting the 2014 and later compliance dates early which would offset the total costs of the regulation for fleets. Projects funded under the SOON program cannot be used by a fleet for compliance with the regulation for the contract period. As described in section 2449.3(d)(2) of the regulation, fleets of less than 20,000 horsepower are not required to apply for funding under the SOON program, but may still choose to apply for SOON funding.

See also the responses in section 6)b)iv) of this FSOR for a discussion of why the fleet size definitions in the regulation were set where they are.

6)e)v) This section was intentionally left blank

6)e)vi) How to Identify Surplus Engines for Moyer

- Comment:** I believe the majority of engines would still be eligible for Moyer funding. The regulation established graduated compliance requirements over a 10 or 11-year period. To meet those requirements an operator must at a minimum meet BACT. When you couple this with the exemptions the majority of a fleet would not be subject to compliance actions for several years into the regulation, and some equipment may not require compliance action until 2019. Hence the majority of engines would provide "surplus" emission reductions for three years or longer.

The question is how to identify those engines that provide “surplus” emission reductions for three years or longer. This could be resolved in a number of ways. For one, an operator wishing to take advantage of Moyer funding would be required to submit a compliance plan covering four or more years into the future. Equipment not target for retrofit or turnover would therefore be eligible for Moyer funding. (CBIA)

Agency Response: To ensure that Carl Moyer Program funded emission reductions are surplus to regulatory requirements, the program has established a minimum three year project life. This means that the incentive funds cannot be used to pay for equipment that is less than three years from its compliance dateline. As described in the Chapter XII, Section E of the Technical Support Document, large fleets have very limited Carl Moyer funding available due to the early compliance deadlines of the regulation. Medium fleets have funding available for projects installed and in operation up until February 28, 2010 after which funding opportunities become very limited. Small fleets are eligible for the incentive funds to pay up to the full cost of retrofits installed and in operation up until February 28, 2012 after which funding opportunities for retrofits becomes limited.

The example Table III-A-6)e)vi)-1 illustrates how eligibility for Carl Moyer funding is determined. Consider a large fleet that requests funding for equipment that would be installed and in operation by February 28, 2009. The fleet is unable to receive Carl Moyer Program funds for the equipment that would have to be in compliance with the rule by March 1, 2011 (shaded area), but would be able to receive funds for equipment whose compliance dates are further away (unshaded area).

Table III-A-6)e)vi)-1- Carl Moyer Program Funding Example

Compliance Date (March 1)	Turnover (% of total hp)	Retrofit (% of total HP)
2010	8%	20%
2011	8%	20%
2012	8%	20%
2013	8%	20%
2014	8%	20%
2015	8%	--
2016	10%	--
2017	10%	--
2018	10%	--
2019	10%	--
2020	10%	--

As such, in order for a large fleet to receive funding for equipment that would be installed and in operation by February 28, 2009, a fleet owner would need to turnover 16 percent (the 8 percent required by March 1, 2010, and the 8 percent

required by March 1, 2011) by February 28, 2009 in order to be eligible for incentive funding for up to 84 percent of the fleet. The fleet would also have to retrofit 40 percent (the 20 percent required by March 1, 2010, and the 20 percent required by March 1, 2011) by February 28, 2009 to be eligible for incentive funding for retrofitting up to the remaining 60 percent of the fleet. Partial funding may be available for fleets that demonstrate compliance with the NOx requirements of the regulation, but not the PM requirements.

Fleets are eligible to receive Carl Moyer funding one time once they are within three years of the first compliance date (Board adoption date for large fleets) to ensure that state funds are not paying for incremental compliance with the regulation and to ensure that reductions are truly surplus to the regulation. Fleets are not required to submit compliance plans to receive funding through traditional Moyer projects.

With addition of the Surplus Optional Opt-in for NOx SOON) Program, Carl Moyer funds may be available to assist fleets in meeting the 2014 compliance dates early. Projects funded under the SOON program cannot be used by a fleet for compliance with the regulation for the contract period. To receive SOON funding, fleets will be required to submit compliance plans.

6)e)vii) Make Funding Available for Costs over \$9/hp per Year

- 1. Comment:** There should be 100% assistance funding, similar to the Carl Moyer program, for any amount over \$9 per horsepower per year. (DER3)

Agency Response: ARB does not have the authority to establish an additional grant program; that authority lies with the California Legislature.

Providing state funding for costs above a certain dollar per horsepower level would have similar undesirable effects as including a cost cap in the regulation (which is discussed further in section III-A-6)k)vii)12) in this FSOR). If fleets were guaranteed state funding for any compliance cost above a certain dollar per horsepower level, they would have an incentive to choose high cost compliance actions such as vehicle replacement because the state would pay for it. Such a system would also discourage fleets from pursuing the actions that are most efficient at reducing emissions. Fleet owner would be much less likely to choose repowers, retrofits and other cost-effective actions that would produce a much larger reduction in emissions per dollar spent.

Providing state funding for costs above a certain dollar per horsepower level would also be unworkable because of the difficulty in agreeing on the normal turnover that would have occurred in the absence of the regulation, which is necessary in determining how much has been spent for compliance. As discussed further in the response in section III-A-3)d)i) of this FSOR, there is a discrepancy between how ARB estimated costs and how many fleets viewed their compliance costs. Many fleets included the cost of vehicles they would

have purchased anyway due to normal turnover in the cost they attributed to the regulation. Providing state funding for costs above a certain dollar per horsepower level would force ARB to debate each fleet's normal turnover practices, which would be time consuming for both ARB and fleets.

6)e)viii) Carl Moyer Program Too Restrictive

- 1. Comment:** Please do not tell me to apply for state programs that help us redo the equipment I own. Whenever the state programs are used, the recipient is obligated to the state agency and loses his or her freedom concerning the business. (PBL)

Agency Response: Historically, state funding programs have been voluntary programs with no obligation from businesses to participate. The funding guidelines are written so that the public funds are spent in accordance with state law or enabling budget language. For example, in the case of the Carl Moyer Program, California state law requires that the emission reductions funded through the program must be real, surplus, quantifiable, enforceable, and cost-effective.

6)e)ix) No Moyer Available

- 1. Comment:** No Moyer funds are available in attainment areas, so I won't be able to access incentive monies. - I am in Solano County. It is not a non-attainment area. When Carl Moyer funds were available, none were available to me – I had to work in Sacramento or San Francisco to qualify. Now, I have been told if I don't run 8000 gallons of fuel through my truck in a year, there is no money for me. I used 3067 gallons last year in both the trucks and the tractors. (CDTOA1)
- 2. Comment:** Low usage equipment need not apply as the minimums will not be funded. (DCCI)

Agency Response: ARB allocates Carl Moyer Program funding annually to air districts in accordance with the allocation formula identified in Health and Safety Code Section 44299.2(i). The formula provides funding to all air districts, and each year air districts are required to either accept or reject Carl Moyer Program funds. The Sacramento Metropolitan AQMD administers the Carl Moyer Program for all the air districts in the Sacramento Federal Ozone Non-Attainment area which includes the Yolo-Solano AQMD.

The Carl Moyer Program has a cost-effectiveness limit, which is a measure of the dollars provided to a project for each ton of covered emission reductions. The cost-effectiveness limit ensures that the funds are being spent on the projects that provide the most reductions for the dollars. Projects that have cost-effectiveness above this limit are only eligible for partial funding. Cost-effectiveness is directly related to the usage of equipment, with higher use

equipment providing more cost-effective emission reductions. While low-use equipment is not pre-empted from participating the Carl Moyer Program, the dollar amount that low-use equipment may be eligible for is likely small enough that the program may not make sense for these equipment owners. In addition, historically the Carl Moyer Program has been oversubscribed with more projects than available funds, so funding has been prioritized to the most cost-effective projects.

6)e)x) Create a Low-Interest Loan Program for Affected Fleets

- 1. Comment:** Create a low-interest loan program to assist affected fleets, possibly with CARB's portion of Proposition 1B funds. (SCAQMD1) (SCAQMD2) (SCAQMD4)

Agency Response: We agree that a loan program for fleets affected by the regulation could be helpful. As stated in Chapter VII of the Staff Report, ARB recognizes that compliance with the proposed regulation may be financially challenging for owners of regulated vehicles. During the course of regulation's development, many fleets indicated they would need to borrow money to purchase the required retrofits and repowers, or to upgrade their vehicles. However, upon inquiring with the financial institutions with which they typically work, many fleets found that financial institutions were: (1) not familiar with lending for retrofit devices which do not make the vehicles more productive or profitable; and (2) unwilling to lend for retrofits of vehicles that already have loans outstanding (because the vehicle to be retrofit itself is typically already used as collateral on an existing loan).

To address this, staff is initiating a pilot project which would direct funds to guarantee loans for fleets to purchase exhaust retrofits to comply with the regulation. To do this, ARB staff is exploring partnering with the California Pollution Control Financing Authority (CPCFA) within the State Treasurer's Office, and working through an existing CPCFA program (the California Capital Access Program) to set up the pilot funding project. Staff is optimistic that this pilot funding project will make additional capital available to fleets to comply with the regulation. In addition to making more capital available to fleet operators, another benefit of the program would be to help familiarize lending institutions with lending for retrofits. If the pilot program is successful, it is envisioned that the loan guarantee program could continue indefinitely, as long as funding is available and the program continues to be utilized.

Staff is also consulting with other state agencies and private lenders to look for additional ways to leverage private sector funding with existing public programs, utilizing potential programs such as government loan guarantees, interest rate buy down programs, etc. It is hoped that these efforts could make compliance with the regulation more affordable and access to capital more widely available.

6)x)xi) This section was intentionally left blank.

6)f)i) Final Requirement to Retrofit in 2021

- 1. Comment:** ARB should revise the requirement that all equipment be retrofitted that does not have a factory installed exhaust after-treatment device or has not been previously retrofitted with the highest level VDECS at the time of installation in 2021. Over the next 13 years, the regulation will require the fleet owners of California to incur a substantial expense without regard for economic fluctuations. The regulation will be difficult to comply with during strong economic years, and nearly impossible in weak years. Fleet owners will need to change most of their fleet management procedures to meet Off-Road fleet targets along with meeting requirements for there On-Road and Portable equipment fleets. After working hard to meet the 2020 targets fleet owners are rewarded with another requirement that does not allow for the useful life of equipment. I have modeled all of Knife River Corporation's California fleets and find the equipment that falls into this portion of the regulation, is generally small, low horsepower, short life equipment, most of which will be purchased in 2009 to 2012 to replace existing equipment early in order to meet early targets. Now it will be necessary to replace it early (again) or retrofit without the ability to spread the cost of retrofit due to its expected useful life. I would like to ask that the 2021 requirement be moved to 2025 to allow fleet owners to get back to a normal turn over cycle. The PM and NOx reductions will be greater in 2025 with new equipment than that of older retrofitted equipment that is forced to run longer. (KRC)
- 2. Comment:** Large GSE fleet owners will not be able to take advantage of the fleet average compliance option through 2020, because they will be required to immediately retrofit all affected vehicles by March 1, 2021. The proposed 2021 GSE retrofit requirement undercuts the flexibility of the fleet average compliance option. The proposed 2021 GSE retrofit requirement undercuts the flexibility of the fleet average compliance option, increases the costs of an already very costly regulation, places the burden of compliance on GSE end-users rather than on manufacturers, and produces no commensurate environmental benefit. During the informal rulemaking process on this proposal, ARB staff presented the fleet average compliance option as an effective method to secure the necessary emission reductions but at the same time allow affected fleets the flexibility to tailor their compliance strategy to the specific needs of their fleet. ARB's endorsements at that time were wholly consistent with the fleet average compliance option in ARB's recently adopted Off-Road Large Spark-Ignition Rule ("LSI Rule"). Thus, ARB's abrupt departure in this proposal from the structure of the LSI Rule's fleet average compliance option was unanticipated and from United's perspective a significant setback in the proposed ORD Rule. In the Staff Report, ARB staff neither discusses nor explains the reasoning behind their decision to restrict and effectively undermine an effective fleet average compliance option.

Instead, in the Staff Report, ARB staff is still presenting the fleet average compliance option as a method that will allow “fleets to comply by meeting a fleet average so each fleet can choose its own best, most cost-effective path toward compliance.” ARB’s explanation ignores the effect of the proposed 2021 GSE retrofit requirement on the flexibility and usefulness of the fleet average option. From an end-user’s perspective, whose responsibility it is to develop and implement a compliance plan, a fleet average concept is useful and cost-effective only to the extent it provides planning flexibility. Here, such flexibility is eliminated by the 2021 VDECS requirement. So too is an effective tool for ARB to achieve cost-effective emission reductions. ARB should reconsider its approach and propose an off-road Rule that allows GSE fleet owners to develop and implement long-term compliance plans that could include a combination of retrofits, lower-emission purchases, and zero-emission electric purchases. This would provide genuine flexibility that does not face an inflexible requirement in 10 years that will control fleet management decisions from the effective date of the rule. (ENDSLEY) (ATA1)

3. **Comment:** The proposed 2021 retrofit requirement is unnecessary to achieve ARB’s stated goals, and has not been adequately explained or justified by ARB. The fleet average emission targets...will fully achieve ARB’s stringent emission reductions goal by 2020. ARB staff did not appear to recognize that the 2021 retrofit requirement undermines much of the flexibility (and thus cost-effectiveness) provided by the fleet average approach when conducting its analysis of reasonable alternatives. See Cal. Gov’t Code § 11346.2(b)(3)(A) (requiring the agency to describe the reasonable alternatives considered and the reasons for rejecting the alternatives). First, ARB staff has failed to explain or justify the 2021 retrofit mandate in the context of a stringent fleet average approach. Second, ARB staff continues to tout the rule as flexible and cost-effective because of the fleet average approach and has failed to come to terms with the effects of the 2021 retrofit mandate in evaluating the alternatives and costs of the rule. Third, the agency’s less-than-forthright reversal is contrary to its obligation to pursue an open rulemaking process designed to increase public participation and improve the quality of regulations. (POHLE)
4. **Comment:** We request that the language be changed to not require additional retrofits for large and medium fleets to March 1, 2025 from March 1, 2021. (CALCIMA)

Agency Response: The change mentioned by the commenters, adding a requirement to apply highest level VDECS to remaining Tier 0 through 3 vehicles in 2021 and later years, at a rate no greater than under the BACT path was presented by staff and discussed with stakeholders at the February 20, 23, 26, and March 1, 2007 workshops in San Diego, Fresno, Sacramento, and Riverside.

These workshops occurred five months before the board voted on the proposed regulation. The legality of the rulemaking process as it relates to the addition of the 2021 retrofit requirement is discussed further in the responses in Chapter 19 of this FSOR.

Staff estimates that by 2027, retrofitting the remaining non-Tier 4 vehicles beginning in 2021 would increase the PM emissions benefits by 13 percent beyond the emissions benefits obtained if the rule did not require the remaining non-Tier 4 vehicles to be retrofit.

This addition does not remove the flexibility granted by the fleet average requirements for fleets to choose their most cost-effective path to compliance. Instead, it simply means that at the end of the eleven year-phase in period in which fleets can choose a combination of retrofits, turnover to newer, cleaner vehicles, and repowering with cleaner engines, they must apply highest level VDECS to their remaining non-Tier 4 vehicles over the next few years. Fleets will typically have fleets that are 60 to 70 percent Tier 4 by this time, so that the 2021 retrofit mandate will affect only a small portion of their vehicles.

Finally, the 2021 retrofit requirement does not apply for another 13 years. Staff will be reporting back to the board on the progress of rule implementation many times before then, and the Board will have the opportunity to evaluate the need for the 2021 requirement as that date approaches.

The cost and affordability of the regulation are addressed in the responses in Chapter III-A-3 of this FSOR.

Please see also the responses in Chapter III-A-8 of this FSOR for a discussion of why staff believes the consideration of alternatives to the regulation was adequate.

6)f)ii) PM Credit for Tier 4 Replacements

- 1. Comment:** The PM BACT compliance option requires that retrofits be installed on 20% of the fleet (by horsepower) every year. As proposed on April 6, the Rule disallows credit for operators who prefer to buy new Tier 4 replacement vehicles that already incorporate emission controls, rather than trying to install and integrate retrofit emission controls on existing vehicles. ARB staff also has indicated that it will recommend to the Board that the ORD Rule be revised to allow Tier 4 vehicles used to replace older diesel vehicles to be counted in calculating compliance with the PM BACT retrofit requirements. ATA urges the Board to approve staff's recommendation and allow PM BACT credit for Tier 4 replacements. (ATA1)
- 2. Comment:** The PM BACT mandate should provide credit for replacements with new Tier 4 engines. As initially proposed on April 5, the

Rule would have disallowed credit toward the annual 20% PM BACT retrofit requirement for operators who prefer to buy replacement vehicles that already incorporate emission controls, rather than trying to install and integrate retrofit controls on existing vehicles. However, as part of its revised proposal of May 23, ARB staff recommended to the Board that the ORD Rule be revised to allow credit toward the PM BACT requirement for purchases of Tier 4 vehicles that replace existing vehicles. ATA supports staff's recommendation to allow PM BACT credit for Tier 4 replacements. It would make no sense to mandate that end-users must try to integrate emission controls into old vehicles, while denying them credit for purchasing Tier 4 vehicles that already incorporate such controls. In addition to being arbitrary and capricious, this provision of the April proposal would be contrary to the federal Clean Air Act (CCA). (POHLE)

Agency Response: We agree that PM BACT credit should be given for Tier 4 replacements. At the July 26, 2007, hearing, the Board adopted Resolution 07-19 approving the adoption of the regulation with modifications; these modifications included granting credit for the replacement of lower tier vehicles with Tier 4 vehicles in lieu of retrofitting (section 2449.2(a)(2)(A)1.a.).

6)f)iii) Unfair to Fleets that Retrofit Early if Delays Occur

- 1. Comment:** Low availability of VDECS could cause some companies who make the first orders to make large financial investments in this technology, while companies who waited to order their VDECS may become exempted if VDEC manufacturers cannot keep up with demand and stop taking orders. (TA)

Agency Response: ARB recognizes the need for more verified diesel emission control devices for off-road application, but does not anticipate widespread delays of VDECS. Also, as discussed in the last paragraph below, there are incentives and advantages for fleets that retrofit early.

A number of technologies are currently verified today, and we expect that more will be verified soon. For a further discussion on the availability of VDECS, please see the response in section III-A-2)a)i) of this FSOR. However, if retrofit manufacturers cannot keep up with the demand caused by the regulation, as per section 2449(e)(5), a fleet would not automatically be exempted from the retrofit requirements. If manufacturer delays occur, a fleet would be considered in compliance only if the fleet had entered into a contractual agreement for the purchase of the VDECS at least four months prior to the required compliance date. Therefore, a fleet is not automatically exempted from the VDECS requirements if manufacturer delays occur. Additionally, we believe that VDECS manufacturers are unlikely to stop selling VDECS if they are unable to keep up with the demand; a more likely business practice would be to expand production while continuing to take and fulfill VDECS orders.

Also, fleets that install VDECS before March 1, 2009 can take advantage of the double PM BACT credit provision in section 2449.2(a)(2)(A)2.a.i. of the regulation. For example, if a fleet installs VDECS on 10 percent of their fleet before March 1, 2009, they will receive 20 percent PM BACT credit for those VDECS. Therefore, a fleet that receives early credit for VDECS could essentially meet their PM BACT requirements for the first year of the regulation at half the cost of those who wait until after March 1, 2009 to purchase VDECS.

6)f)iv) Give a One Year Grace Period for New VDECS

- 1. Comment:** Unless I missed it, I did not see any cut-off date for certified devices. Obviously, if a device is certified a month before a compliance date, it would be virtually impossible for me to determine feasibility, and get the unit order shipped and installed by the deadline. The regulation should use a date one year ahead of a compliance date as the cutoff date for what constitutes a certified PM control device. (CBIA)

Agency Response: As stated in section 2449(c)(27) of the regulation, a highest level VDECS is a device that has been verified by ARB under its Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emission from Diesel Engines (Verification Procedure), title 13, California Code of Regulations (CCR), and sections 2700-2710, for a specific engine as of 10 months prior to the compliance date. Additionally, in the event of VDECS manufacturer delays, a fleet owner will be considered in compliance as long as a contractual agreement for purchase was entered at least 4 months prior to the compliance date.

6)f)v) Grant an Extension for VDECS Learning Period

- 1. Comment:** The regulation includes a provision for compliance extensions when “verified diesel emissions control strategies” (VDECS) equipment is unavailable. The current list of VDECS that may be used for regulation compliance is short and use of these types of devices in California has been relatively limited. In our experience with emerging technologies, there is an expected six to nine month “learning period” for fleet managers and maintenance staff to effectively install and maintain after-market control equipment. The City encourages the ARB to account for this learning period in the time frame of any compliance extensions (i.e. variances) granted in relation to a manufacturer’s release of new products. The City hopes to participate in demonstrating new technologies and encourages the ARB staff to play a lead role in facilitating the widespread use of retrofit technologies, for example by providing for exchange of trouble-shooting information and facilitating communication between technology users and manufacturers. While technology testing and demonstration programs require time and resources, they are necessary to minimize the likelihood that unsafe or ineffective control equipment penetrates the market. (LACITY)

Agency Response: We do intend to play a role in facilitating the widespread use of retrofit technologies; however, we disagree that a designated “learning period” is required. The regulation’s definition of highest level VDEC effectively provides 10 months for a fleet owner to install a newly verified device. (See section 2449(c)(27) The regulation also includes provisions for manufacturer delays, the use of experimental control strategies, and VDECS failures, which all provide compliance extensions if necessary. Also, we plan to work with other groups at ARB to develop training materials for VDECS installations and maintenance, which we hope will minimize the likelihood of unsafe or ineffective VDECS installations and usage.

Additionally, we recognize the need for more verified diesel emission control devices for off-road applications. Therefore, staff has been collaborating with the Mobile Source Air Pollution Reduction Review Committee (MSRC) of the South Coast Air Quality Management District (SCAQMD) to develop and implement the “Showcase Program”. The Showcase Program, which has been funded in the so far with \$1,000,000 from MSRC, will pay for the cost and installation of retrofit devices in the South Coast Air Quality Management District. It is designed to encourage owners of off-road diesel construction equipment to work with diesel emission control system manufacturers to retrofit their engines with diesel emission control devices. The goal of the program is to demonstrate new emission control systems that will earn ARB-verified status, while achieving significant near-term emission reductions of both PM and NOx. Participation in the Showcase Program is open to private construction companies, public agencies, local governments, and other owners of off-road diesel construction equipment in the SCAQMD.

6)g) Reporting / Recordkeeping

- Comment:** The implementation of administrative record keeping will be a tremendous burden to business. (ESCOBEDO)

Agency Response: We disagree. The regulation requires the collection of the minimum information required to enforce the rule. For many fleets, much of the information that is required to be collected and reported under the rule is likely already being tracked for maintenance, budgetary, or other purposes. Smaller fleets will not have many vehicles to report. Additionally, ARB will attempt to reduce the reporting burden by enabling fleets to upload fleet information over the internet from spreadsheets or enter fleet information directly into a web-enabled ARB database.

Initial reporting is required of all fleets in 2009. However, annual reporting is not required until 2012 for medium fleets, and not until 2014 for small fleets. Large fleets will have to report annually through 2020. Only changes in fleet information must be reported for annual reporting. If the fleet information does

not change from year to year, the fleet owner will simply have to attest that the existing fleet information is correct.

The estimated costs for reporting and record keeping have been included in the Staff Report and Technical Support Document. See also the response to comment 3)d)x) in Chapter III-A-3 of this FSOR for a discussion of how staff accounted for recordkeeping costs.

2. **Comment:** We would like to express our concern that individual fleet specifics never be released in such a way that would allow unfair business competition in the marketplace. We would request that CARB ensure that detailed fleet information not be available on a company by company basis and that even if it were allowed on a regional basis, CARB should first ensure that enough businesses were in the region to prevent anyone from identifying a specific fleet. (CALCIMA)

Agency Response: ARB has a history of preserving trade secret information that it receives from businesses that it regulates, and it will similarly work to protect confidential fleet information submitted pursuant to this regulation.

The California Public Records Act, Government Code section 2050 et seq. (CPRA), requires ARB and other state and local agencies to release public records that are requested by a member of the public unless the CPRA or other law exempts the records from disclosure. To protect confidential business information that it receives, ARB has adopted a process at sections 91000-91022 of title 17, California Code of Regulations, for receiving and handling information that may be exempt from disclosure as a trade secret. The process requires a business submitting information that it believes constitutes a trade secret to label the information as confidential,. The process then lays out steps that will be followed in the event information designated as confidential is requested under the CPRA. If ARB determines during the process that information marked as confidential does qualify as a trade secret, it will deny the public records request and refuse to disclose the information. However, emissions data is not considered a trade secret and will be released by ARB in response to a request for the information. ARB may also disclose information considered to be trade secrets to the U.S. Environmental Protection Agency, which itself protects trade secrets under similar provisions in the federal Clean Air Act and federal regulations.

ARB staff anticipates making certain tools available to collect and share information with members of the public, but will be taking precautions to ensure confidential information is not shared as part of these efforts. We have not yet built the electronic reporting tools or database that will be used during implementation of the regulation. However, we plan to provide information on the ARB website so that someone seeking to hire a firm that owns off-road vehicles

could check to see whether that firm has complied with the regulation and been issued a Certificate of Reported Compliance.

Also, staff may provide an internet lookup tool which would enable the public to enter the ARB equipment identification number (EIN) for a vehicle observed in the field. The lookup tool would return the equipment type, manufacturer, model, model year, and retrofit information for that EIN if the EIN were legitimate. The lookup tool would not indicate the fleet to which the vehicle belongs, and since the assigned EINs are unique but randomly assigned, the public would not know the owner of the vehicle. This tool would enable fleet owners that are complying with the rule and other individuals a means of identifying and reporting vehicles labeled with a fraudulent EIN.

ARB staff may publicly report aggregated vehicle information to the Board during review of the rule. However, staff would work to ensure that individual fleet information could not be inferred from the aggregated data.

3. **Comment:** The current reporting date in the regulation for medium fleets is June 1, 2009. Metropolitan's budget and internal reporting is done on a fiscal year cycle from July 1st to July 1st. We would appreciate flexibility in the reporting timeframe to align with the fiscal year cycle, so a mid to late July or August reporting date would fulfill this request. It is our understanding that other public agencies' budgets are also aligned with fiscal year reporting. (SOCALMWD)

Agency Response: We recognize that some business entities may have business cycles that do not match the reporting period specified by this rule. However, we chose a March 1 compliance date to give fleets opportunities to install retrofits and upgrade vehicles and engines during the wet season, when construction vehicles are less likely to be operating, and have those changes credited to the fleet effective March 1. We set the April 1, June 1, and August 1 reporting dates for large, medium, and small fleets, respectively, to stagger the reporting so that not all fleets will be reporting at the same time. Staggering the reporting dates will enable ARB staff to be more available for assisting fleets with reporting.

We plan to have reporting tools available so that fleet owners can enter their fleet information as early as the fall of 2008. This would minimize the information that would have to be entered or modified by the initial reporting date in 2009. Fleet owners will have 30 days to report vehicle modifications or vehicles added or deleted to the fleet.

Also, staff will work with individual fleets to help answer questions or resolve issues that might stand in the way of the expeditious submittal of fleet information to the ARB.

Since the reporting year ends effective March 1 each year, a medium fleet owner like Metropolitan will have as long as three months to compile and report all required information for the reporting year. Less time was provided for large fleets because ARB expects that most large fleet operators have record keeping systems in place to track most of the information required under this regulation. Conversely, more time was provided for small fleet owners to submit their data because they might have a greater need to adjust their record-keeping practices, and many might have fewer resources for such data gathering.

4. **Comment:** It is unclear how an Equipment Identification Number (EIN) would be obtained during the period prior to the initial reporting date. It would be most efficient to affix an EIN to a piece of in-service equipment at the time data are collected for initial reporting since equipment owned by rental companies is generally in the field. (ARA2)

Agency Response: ARB will make available EINs as early as possible to fleet owners that submit to the ARB the necessary and complete fleet information. Staff expects that fleet owners will be able to upload their fleet information over the internet from spreadsheets or enter fleet information directly into a web-enabled ARB database. As soon as complete fleet information is submitted online, EINs will be automatically generated which the fleet owner can then use for labeling its vehicles. Fleet information submitted to ARB in writing may take 60 to 90 days to process before EINs can be provided.

6)h) Idling

1. **Comment:** The exclusion from the idling limitation should be more clearly defined. We are concerned about the wording of the exemptions for "idling necessary to accomplish the work for which the vehicle was designed (such as operating a crane)" and "idling necessary to ensure safe operation of the vehicle". CAPCOA agrees that equipment should be allowed function as it is designed to do, and that it should be operated safely. However, under this wording, it will be very difficult to identify allowable and prohibited idling in the field. We ask the ARB to include specific examples regarding what is and what is not to be considered exempt, rather than relying on these broad categories. If a waiver is granted under Section 2449(d)(3)(C), a copy of the document should be kept in the vehicle in the event that its idling is challenged. (CAPCOA)

Agency Response: As provided in the in-use off-road diesel vehicle regulation, no vehicle or engine subject to the regulation may idle for more than five consecutive minutes, except as provided in the exemptions noted in section 2449(d)(3). While staff acknowledges that the regulation does not include exhaustive examples describing each possible instance under which a vehicle could qualify for the idling exemptions, this was intentionally done to keep the regulation as concise, simple and broad as possible. However, staff agrees with the commenter on the need to provide clarity in the idling limitations in the

regulation. Therefore, in order to provide greater clarification, including providing specific examples of allowable and prohibited idling activities, we plan to provide further detail on the idling exceptions in the guidance materials developed and distributed during implementation of the regulation. As of March 1, 2009, medium and large fleets must also have a written idling policy that is made available to operators of the vehicles and informs them that idling is limited to 5 consecutive minutes or less (2449(d)(3)(B)). In addition, all fleet owners must submit reporting information by their initial reporting date. Part of the initial reporting requirements includes stating whether the fleet has an idling policy documented and available to employees (2449(g)(1)(A)14.).

We also agree that it would facilitate enforcement of the regulation if vehicle owners kept in the vehicle a copy of any idling exemption(s) granted by the Executive Officer under section 2449(d)(3)(C). We plan to provide this suggestion in the guidance materials developed and distributed during implementation of the regulation.

6)i) Enforcement

See Chapter III-A-11 of this FSOR

6)j) This section was intentionally left blank

6)k) Other Issues with Regulation

6)k)i) Do Not Make Regulation Open-Ended

1. **Comment:** ARA will not support any regulation brought to the Board that is open-ended in terms of mandatory emissions reductions. Our industry expects that any regulation provides assurance that we can implement a long-term business plan that accommodates the regulation. An open-ended regulation would provide no such assurance. (ARA1)

Agency Response: We agree that the regulation should provide certainty to allow affected fleets to effectively plan for compliance. As such, the statewide regulation is not open-ended.

However, the Board added the Surplus Off-Road Opt-in for NOx (SOON) program to the regulation for the purpose of using public funds to achieve additional emissions reductions beyond those that will be achieved by the statewide regulation. SOON will only affect fleets in air districts that opt into the program and is only expected to affect the largest fleets in those districts. It can only be mandatory for fleets with 20,000 hp or greater, which is only a small minority of fleets. The SOON program is described fully in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008 and is discussed further in the responses in Chapter III-A-9 of this FSOR.

While one might argue that the SOON program is somewhat open-ended in its structure, and that it hinders the ability of fleets to implement long-term business plans for the purpose of compliance. However, ARB would disagree with such a characterization. Although fleets cannot predict with certainty whether they will be impacted by SOON until their local air district decides whether or not to opt-in, and they cannot know in advance if they will be awarded SOON funds, the fact that the fleet does not have to perform additional reduction measures unless they are provided public funds reduces the uncertainty to the fleet, and should not adversely impact the long-term business plans of the fleet.

In including the SOON program in the regulation, the Board decided the need for additional NOx reductions outweighed the uncertainty that SOON creates by being somewhat open-ended for fleets in districts that opt into the program. ARB staff have committed to overseeing district implementation of the SOON program to ensure it is fair and manageable for fleets that are required to participate in it.

6)k)ii) Use Real Emission Factors

- 1. Comment:** Use the certified emissions level in the calculation of fleet average in the regulation, not the certification standards, which are substantially higher than actual emissions. The certification levels are 10 to 25 percent below the certification standards. The stationary and portable Air Toxic Control Measures use the certification levels for calculations. Using the certification standard requires extraordinary measures to reduce emissions that do not really exist. (CIAQC7) (NWS) (NWS3)
- 2. Comment:** The definition of Emission Factor should be changed to allow manufacturer's emissions data to be used in lieu of the certification standard values in Appendix A to the regulation. (SOCALMWD)

Agency Response: Staff disagrees, and believes that basing the emission factor in the fleet average calculations on the certification standard, rather than on the certification level, is a better approach. Thus, staff included certification standards in the Emission Factor tables in Appendix A to the regulation.

Staff's rational for using the certification standard over the certification level is documented in Chapter XII, Section C1 the Technical Support Document ("Certification Standard Versus Certification Level"). As described in the Technical Support Document, the certification level that is shown in the engine certification executive orders represents a summary of certification test data conducted on one engine, but meant to represent the certification of many engines (known as engine families). Engine manufacturers do not guarantee that this data represents the emissions from an individual in-use engine within this engine family. The certification standard however, represents an enforceable, upper bound limit for all engines within the engine family. The

engine manufacturers certify that their engines within a given engine family will remain within these limits for their durability periods. Staff used the certification standard as it represents an enforceable limit. Use of the certification standard is also consistent with how the fleet average provisions in ARB's large spark ignition rule are structured (title 13, CCR section 2775).

If staff had opted to include the certification level rather than the certification standard in the calculation of the PM and NOx indexes, the fleet average targets would have been accordingly adjusted. For example, if the certification levels were generally 30 percent lower than certification standards, then the fleet average targets would all have been reduced by 30 percent in order to achieve the same emission reductions. Using the certification level in lieu of the certification standard in the fleet average would, accordingly, not affect the overall stringency of the regulation (i.e., the actions of fleets required to meet the targets and to result in actual emissions reductions).

Staff also does not support allowing fleets to supply manufacturers' emissions data to support use of alternative Emission Factors for the following two reasons:

First, because, as described above, we believe certification standards provide the best representation of the enforceable limit to which an engine's emissions are held; and

Second, because reviewing such documentation for the nearly 10,000 fleets and 180,000 vehicles affected by the regulation would place an unreasonable burden on ARB implementation staff and would reduce the amount of time such staff could spend assisting fleets with compliance with the regulation.

6)k)iii) Take Equipment Lifespan into Account

- 1. Comments:** The regulation is unfair because equipment with a usable 30-year lifespan is being deemed unusable in California and must be repowered within a short timeframe. (PCAA)
- 2. Comments:** Imagine if everyone in California or the U.S. would have had to get rid of anything currently older than 1996, cars, trucks, tractors, lawn mowers, motorcycles etc. within 2yrs and buy all brand new vehicles. Could you see what would happen? A public uproar of unimaginable proportions. YET THIS IS WHAT THE CALIFORNIA AIR RESOURCES BOARD ESSENTIALLY IS PROPOSING THAT CONTRACTORS MUST DO WITH EQUIPMENT THAT IS OLDER THAN 1996. This equipment can last for many years, this is why bulldozers, cranes, back-hoe's, chippers, stump grinders, graders etc cost so much. (PB)

Agency Response: We understand that the regulation requires accelerated turnover of vehicles, which will require that vehicles be sold, retired or repowered before the end of their normal life, and that this will result in a cost to the fleet owner. However, accelerated turnover is the main method by which the

regulation is expected to achieve significant reductions in NOx emissions. In developing the cost estimates presented in Chapter VII of the Staff Report and Chapter XI of the Technical Staff report, we included the costs associated with accelerated turnover.

See also the responses in Chapter III-A-3 of this regulation for further discussion of how the costs of the regulation were calculated.

6)k)iv) Bifurcation of the Regulation

6)k)iv)1) Bifurcation of the Regulation is Good

1. **Comment:** ARB should divide the proposed ARB Off-Road Rule into separate NOx and PM rules, thereby facilitating the adoption of in-use off-road diesel emission reduction measures, not only in California but the rest of the country. (CATF2) (CATF3) (UCS5)

Agency Response: Staff agrees with this comment. At the July 26, 2007, Board meeting, the Board unanimously voted to adopt the proposed in-use off-road diesel vehicle regulation, along with some modifications. One of the modifications approved by the Board was to restructure the regulatory language so that the PM and NOx requirements were presented in separate sections. In the First Notice of Public Availability of Modified Text and Availability of Additional Documents (First Notice), which was released on December 11, 2007, staff made the changes directed by the Board to bifurcate the regulation in to separate sections addressing the NOx and PM requirements.

6)k)v) Double Control Required

1. **Comment:** Under the annual emission reduction targets required under this proposal, many contractors will be required to first re-power or retrofit an engine, only to have to turn around a few years later and replace the entire piece of equipment when the technology to do the job right finally hits the marketplace. (MCCULLOUGH)
2. **Comment:** In the later years of the program, vehicles that were previously replaced (to meet tier 4 standards) may need to be replaced again to meet fleet average Tier 4 standards. (MCQUEEN1)
3. **Comment:** Due to the timing of the regulation compared to the timing of engine development, some companies will have to purchase some upgraded equipment twice. (HCC) (CSIA)
4. **Comment:** We will all spend millions of dollars a year over the next five years just to re-spend that money when Tier 4 technology is available. (CAMARILLO4)

5. **Comment:** The requirements of the rule as currently proposed, with annual fleet average standards for both NOx and diesel PM, lead to situations in which compliance with the rule will require “double control” of the same equipment, including purchases of new units to meet early year requirements that must later be retrofit to meet later requirements, or retrofit of existing units that must later be scrapped once new Tier 4 vehicles are available.

Given the structure of the Rule, fleet managers will have little alternative but to engage in large-scale purchases of Tier 3 engines to achieve compliance with early year targets. However, these newly-acquired vehicles will not satisfy the Rule’s stringent final 2020 fleet average targets, and many or all must be scraped or retrofit within a few years in order to maintain compliance with the Rule’s requirements. In part, this is because the Rule imposes inflexible, inconsistent, and stringent annual requirements for the control of two different pollutants at the same time. Control of NOx and diesel PM are generally accomplished through different and not always complimentary means. For example, while VDECS retrofits theoretically could reduce PM emissions sufficiently to satisfy in large measure the early-year fleet average requirements for PM (setting aside for the sake of argument the problematic aspects of such retrofits for GSE, discussed in Part VI, below), the early NOx fleet average standards can currently be met only by replacing vehicles or vehicle engines.

Most of all of the new Tier 3 engines acquired for purposes of compliance with the early-year targets of the ORD Rule will either need to be scrapped in favor of Tier 4 or will require retrofit with Level 3 VDECS, either within a few years of acquisition (to comply with PM fleet average requirements), or to comply with the 2021 retrofit mandate. As discussed below in Part VI.A, given the highly diverse GSE fleet, any attempt to install VDECS would require a significant design/engineering effort, even after which the feasibility and operational reliability of the retrofit is not assured. In addition, such Tier 3 engines will also quickly become a liability with respect to compliance with the Rule’s later-year fleet average emission standards. A regulatory structure that provides enough flexibility to allow significant investments in Tier 4 engines would avoid most of all of the double control issues presented by the current proposed Rule, and speed the introduction of vehicles that contain such new engines. (POHLE)

Comment: Because of these implications, ARB staff’s recommended regulation could cause over two thirds of the privately owned construction companies in California to shut down or at least downsize from a large fleet to a small fleet, primarily because only the largest, most progressive companies have the resources to replace or repower most of their vehicles with Tier 3 equipment commencing in 2010 and again with Tier 4

equipment commencing in 2014 or 2015 in order to comply with the 2020 fleet average. Your staff's last minute addition of a NOx emission reduction requirement will eliminate even these companies from compliance. (CIAQC2)

6. **Comment:** Under the annual emission reduction targets required under this proposal, many contractors will be required to first re-power or retrofit an engine, only to have to turn around a few years later and replace the entire piece of equipment when the technology to do the job right finally hits the marketplace. (MALDONADO2) (PPC) (ACL) (ARTBA2)
7. **Comment:** I've looked at the [HUSS]. We've got about a hundred pieces. We've repowered six of them, so a little better than 5 percent. We've gone with the Tier 3. We're putting Detroit motors in Caterpillar scrapers – they just happen to fit -- because at the time we could get two or three from them and not from Cat. But I'd like to do things once. Right now we can't do it once. (TNT)
8. **Comment:** The replacement value in our normal time frame would be \$1.2 million. We think we'll have to do this twice. If the regulation was voted into effect, all our equipment will have to be replaced twice within 12 years. One would be normal and one time would be driven by these regulations. Aftermarket devices we've determined on our stuff are impractical. (WPC3)
9. **Comment:** There has got to be a better way to address the issue of clean air. To force a contractor to park, scrap and/or sell his Tier 0 (1996 and older) equipment to another state is not the answer. Coastal Earthmovers, Inc. keeps all of their equipment in excellent mechanical condition. To force contractors to upgrade eligible equipment (they do not include Tier 0 as eligible) to Tier 3, and then have to upgrade to Tier 4 when the Tier 4 technology is developed and available is not viable. We need to move forward, rather than backwards. Make all new equipment comply with Tier 3, and when Tier 4 equipment technology becomes available, make all new equipment comply with Tier 4. (CEI3)
10. **Comment:** We will all spend millions of dollars a year over the next five years just to re-spend that money when Tier 4 technology is available. (CAMARILLO7)

Agency Response: We recognize it is desirable for fleets not to have to take more than one action on a vehicle during the course of the regulation (i.e., to double control a vehicle). During the development of the regulation, staff made efforts to reduce the frequency of this happening. As such, the regulation contains a number of provisions meant to reduce the chance that vehicles will be subject to double control:

- New vehicles are guaranteed a 10-year life before they can be subject to turnover requirements;
- Vehicles are guaranteed a 5-year life before they can be subject to retrofit requirements; and
- If a vehicle is retrofit with the highest level VDECS, it is guaranteed a 6-year life before it is subject to turnover requirements.

However, due to the urgent need for reductions of diesel PM, and because Tier 4 vehicles will not begin to be available until around 2014 for most horsepower groups, in some cases fleets that start out with a large portion of relatively higher polluting Tier 0 or Tier 1 vehicles will need to retrofit some vehicles in the first years of the regulation and then subsequently replace or repower them after their 6-year guaranteed life is over. In addition, we acknowledge that the regulation will cause some fleets to acquire a Tier 2 or Tier 3 engine, and then have to retrofit it with highest level VDECS in 2021 (for large fleets) or 2026 (for medium fleets). The need for this requirement is explained in the response in section III-A-6)f)i) of this FSOR.

However, staff believes it will be unusual for the regulation to require a fleet owner to replace a vehicle multiple times during the course of the regulation. As discussed in the responses in section III-A-6)c)i) of this FSOR, to confirm this, staff analyzed one of the very large, dirty fleets operating in California with an average age of over 20 years. Staff's analysis showed that this fleet was able to comply with the regulation without having to turn over a vehicle more than once during the life of the regulation. Furthermore, as shown in Table III-A-6)k)v)-1 below, in 2020, this particular fleet would be able to comply with the requirements of the regulation with over 40 percent of its horsepower meeting the Tier 3 engine standards, and even having a substantial percent of its horsepower meeting the Tier 2 and Tier 1 engine standards.

Table III-A-6)k)v)-1: Percent Tier Distribution of a Compliant 21 Year-old Large Fleet in Year 2020

Tier	HP
T1	2.83%
T2	8.20%
T3	40.55%
T4I	27.79%
T4	20.63%

In no case did the fleet have to turnover a vehicle that was purchased to comply with the rule; since other California fleets will likely begin complying with the regulation having a cleaner, newer fleet, staff expects that they will have an easier time complying with the rule than this older, dirty fleet.

On the other hand, if a fleet owner complies in the early years by purchasing only the very oldest vehicles allowed under the rule (those with Tier 2 engines), we

recognize they will likely have to get rid of those vehicles to comply with the rule in later years. However, it is likely that fleet owners can avoid being forced to turn over a vehicle that was purchased to comply with the rule if they are diligent and careful in their planning. Lastly, as presented by staff at the May 25, 2007, Board meeting and as illustrated in Table III-A-6)k)v)-1 above, a fleet does not need vehicles having all Tier 4 and Tier 4 Interim engines to comply with the final requirements of the regulation; a fleet can comply on the final compliance date with a mix of vehicles having Tier 2, Tier 3, and Tier 4 engines.

6)k)vi) This section intentionally left blank

6)k)vii) Alternative Provisions Suggested

- 1. Comment:** It is recommended that CARB revise the regulation to concentrate on decreasing emission levels from Tier 0 and Tier 1 diesel engines in the early stages of this regulation. This can be accomplished by allowing fleets to remove these engines from their fleets (and get credit for this) and allow fleets to apply Federal EPA verified technologies applicable to Tier 0 & 1 diesel engines. (GC2)

Agency Response: The regulation already encourages fleets to concentrate on decreasing emissions from Tier 0 and 1 engines in the early years of the regulation. Such engines are significantly dirtier than higher tier engines. For example, section 2449.1(a)(2)(A)3. provides that all Tier 0 and Tier 1 engines without a PM standard must be turned over before higher tier engines can count toward the BACT turnover requirements. The effect of this will be to force fleets to repower or replace their Tier 0 and dirtiest Tier 1 engines in the early years of the regulation at the rate of eight percent of total fleet horsepower per year.

The regulation will also require that verified devices be applied. Fleets may choose to apply these to Tier 0 or 1 engines first or to apply them to higher tier engines. We did not mandate that retrofits be applied to Tier 0 and 1 engines first because we wanted to provide flexibility to fleets and avoid requiring fleets to retrofit a vehicle and then subsequently replace it later. (See also the discussion of how the regulation strives to avoid double control in section III-A-6)k)v) of this FSOR.)

Please see the response in section III-A-2)a)iii)1) of this FSOR for a discussion of why we only recognize verifications granted by ARB. If a device has been verified through federal EPA but not through ARB, because the U.S. EPA verification procedure is not as stringent or thorough as ours, we do not believe we should force fleets to use it. If a device is in the process of applying for ARB verification, the Executive Officer may grant a fleet permission to use it and get credit for it via the experimental VDECS procedures in section 2449(e)(5).

- 2. Comment:** Our recommendation is for CARB staff to develop a unique sticker or license plate with small numbers to be placed on the equipment

or approve an alternative method approved by the Executive Officer. The Portable Equipment Registration Program regulation requires similar labeling. However, we are concerned about regulatory liability if a label becomes lost or unreadable. We believe that the Executive Officer of CARB should have the discretion to approve alternative means to demonstrate that a regulated vehicle is compliant. Accordingly, we suggest that CARB revise the (language) as follows:

For each vehicle subject to this regulation, CARB will issue a unique EIN to the fleet owner for each vehicle subject to the regulation in response to the initial reporting described in Section 2440(g) (1) and the annual reporting described in Section 2449 (g) (2). All owners of engines subject to the regulation must perform the following or provide an alternative form approved by the executive Officer or designee that is reasonably accessible at the time of inspection by the enforcement agency: (USN)

Agency Response: We disagree. We did not structure the regulation to include a sticker or license plate issued by ARB for a number of reasons. First, it would be labor- and resource-intensive for ARB to produce and distribute stickers or license plates for the approximately 180,000 vehicles covered by this regulation. Second, we did not want to mandate one type of sticker or label because we wanted to give fleets the flexibility to find the most cost-effective, appropriate way to label their vehicles. The regulation gives fleets the freedom to label however they want – a sticker, placard, painted sign, etc; fleets are simply responsible for maintaining the legibility of the label and following the specifications in section 2449(f). Different fleets may choose to use different methods for labeling because they use their vehicles differently and operate them in different environments.

Because of the flexibility already offered fleets in how they choose to label their vehicles, we do not believe it is necessary to provide the Executive Officer the discretion to approve alternative means of demonstrating a vehicle is compliant. As described in Section X.B. of the Staff Report, the Equipment Identification Number (EIN) labels are an important part of the enforcement scheme for the regulation, and we believe it is reasonable to require fleets to keep their vehicles labeled with an EIN as specified in the regulation.

6)k)vii)1) Allow Sale of Level 1 and 2 Devices to Rural Public Agencies

- 1. Comment:** Retired vehicles with Level 1 or Level 2 devices should be eligible for sale to public agencies in rural or low population counties. This will ensure that those agencies accelerate the replacement of their old equipment. Selling one of these units to government agencies would also ensure that the equipment does not find its way back into the urban areas of California. (GLATKY)

Agency Response: We disagree. Vehicles with Tier 0 engines will not be eligible for sale in California after March 1 2009 regardless of any retrofits that may be installed on a vehicle. This restriction is necessary to prevent the most polluting vehicles from remaining in service and to ensure that fleet owners purchase less-polluting vehicles. Even with VDECS, Tier 0 vehicles will likely emit greater levels of NOx and perhaps PM emissions than higher tier vehicles.

Also, VDECS will not be counted toward compliance with the regulation unless it is installed on a Tier 2 or higher engines and it is the highest Level VDECS available for the vehicle. The intent of the regulation is to achieve the most emissions reductions possible in the most cost-effective manner. Lower level VDECS will not achieve the greatest emission reductions.

Low-population county local municipality fleets as well as fleets in captive attainment area fleets are exempt from the NOx fleet average requirements; however, they must still limit their purchase of vehicles retired from other fleets to those vehicles that do not make their fleets dirtier as specified in section 2449(d)(7).

Please see also the first response in Chapter III-A-1 for a discussion of why emission reductions are beneficial, even in rural areas.

6)k)vii)2) Do Not Require 1.18 Factor in Hours in Fleet Average Option

- 1. Comment:** As part of its May 23 proposed revisions to the Rule, ARB staff recommended that a factor of 1.18 be used in calculating fleet average emissions indexes for both diesel PM and NOx under the “hours in fleet” activity-weighted fleet average emissions option. In effect, this would arbitrarily add 18% to the calculated fleet average emissions of any fleet that elects to comply under the “hours in fleet” option. There is no basis for such a factor, and no explanation or support appears in the rulemaking record. An accurate calculation of a fleet’s emissions weighted by use does not require the use of any such arbitrary factor, which can only reduce the accuracy of the emissions calculation. Accordingly, the Board should not adopt staff’s suggestion of adding the 1.18 factor.
(POHLE)
- 2. Comment:** We are concerned that companies that have consistently purchased lower-emitting and newer vehicles in the past may be unfairly penalized in the latest version of the regulatory language. Earlier versions of the regulatory language provided an option for fleets to comply with fleet average requirements by multiplying the emission factor by the horsepower by the annual hours operated. This format would encourage fleets to run newer, lower-emission vehicles at a higher rate rather than reliance on older high-polluting vehicles, thereby lowering overall harmful emissions.

In many cases, this 18% penalty makes it MORE cost-effective for operators to comply by following the standard emission factor multiplied by horsepower calculations. In effect, this change appears to encourage operators to use higher polluting older equipment at higher levels, since this compliance path is blind to the actual hours of operation of lower versus higher-polluting units

We believe the 18% penalty effectively removes the incentive to minimize the use of older engines and will actually lead to higher emission levels. We suggest that ARB consider eliminating the currently proposed 18% penalty for fleets using the hours-of-operation compliance calculation. (STODDARD)

3. **Comment:** The regulatory language, as it stands, excuses equipment operated for 100 hours or less from regulation. Any equipment that is used more, whether worked 101 hours per year, or 2,000, is treated exactly the same. A company that operated their equipment for 500 hours a year would be subject to the same costs as a company making four times as much income and producing four times as much pollution. To avoid requiring all equipment in the state to be fitted with devices to record their usage, if individual companies felt it was cost-effective to use such devices to obtain more lenient regulation, they could do so voluntarily. This would allow moderate-use fleets to take on a more proportional burden, and may also encourage them to be more efficient to avoid going over a threshold, saving petroleum resources and perhaps encouraging innovation. (HCC)
4. **Comment:** The regulation should recognize the larger engines that have fewer compliance options through a horsepower-hour option, either just for the larger engines or for all engines. (MCQUEEN3)

Agency Response: We disagree that the 1.18 factor should be removed from the Hours in Fleet Average Option. To give fleets the ability to concentrate their compliance dollars on relatively heavily used vehicles, as suggested by commenter HCC, the regulation includes section 2449(d)(2), the Hours in Fleet Average Option. This section states:

As an alternative to the formulas for calculating NOx index and diesel PM index in sections 2449.1(a)(1) and 2449.2(a)(1), fleet owners may opt to include annual hours of operation for all engines in the fleet on the compliance date in the calculation as follows:

NOx Index = 1.18 times [SUM of (Max Hp for each engine in fleet on compliance date multiplied by NOx Emission Factor for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance

[date)] divided by [SUM of (Max Hp for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)]

Diesel PM Index = 1.18 times [SUM of (Max Hp for each engine in fleet on compliance date multiplied by PM Emission Factor for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)] divided by [SUM of (Max Hp for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)]

Older vehicles are generally used less than newer, so a typical fleet would have lower indices using the hours in fleet average formula than with the regular formulas in sections 2449.1(a)(1) and 2449.2(a)(1) if the 1.18 factor were not included. As staff explained in the May 25, 2007, board presentation, in order to preserve the emission benefits of the rule, the index using hours had to be scaled up. If you took all the fleets and figured their fleet index with the hours option and without it, the indices with the hours option would be lower than without by about a factor of 1.18. Therefore, we included the 1.18 factor to ensure the stringency of the regulation is equivalent when using the hours in fleet average option to when using the regular formulas.

The hours in fleet average option is an option meant to provide additional flexibility to fleets, and whether to use it or not is up to affected fleets. If the inclusion of the 1.18 factor makes the hours in fleet average option unattractive, fleets may choose not to use it.

5. **Comment:** Section 2449(d)(1)(D) - Hours in Fleet Average Option - In order to prevent any possible manipulation of this section, the hours of operation should be considered in calculating both the NOx and PM target rates as well as the NOx and PM index. The inclusion of operating hours to calculate the target and index rates would provide a better correlation between target/index rates and the actual emissions and should be considered as a requirement for large fleets. (SCAQMD1)

Agency Response: We disagree for the reasons described below. If a fleet utilizes the section 2449(d)(2) Hours in Fleet Average Option, it computes its indices using its hours of operation but not its targets. If the targets in the hours in fleet average option were calculated using the hours of operation, a fleet could potentially find it impossible to plan their compliance actions. Every time the fleet used its vehicles, the targets would change, and could potentially become tighter as the compliance date approached. This could make it difficult or impossible for the fleet to plan its compliance actions. In addition, using the same target calculations as elsewhere in the regulation keeps the regulation shorter, simpler, and easier to understand.

6)k)vii)3) Allow Alternative Compliance Plan

- 1. Comment:** Our California fleet produces 0.038 tons/year of PM, and 0.466 tons/year of NOx. While the emission reductions proposed in the rule remove most of these emissions at increasing costs for each action level, BNSF remains confident that these emissions can be reduced further by means of an Alternative Compliance Option. For instance, purchasing a low emitting switch locomotive might provide a greater level of emissions reduction in areas where more people reside at far less expense than the currently proposed regulation. Amend language to allow for an Alternative Compliance Option that produces at least the same emissions reductions as provided for in the proposed rule. (BNSF)

Agency Response: It is important to note that the regulation provides significant flexibility for fleets to find their own preferred path to compliance by utilizing the fleet average provisions. However, ARB is not allowing fleets to propose alternative compliance plans for a number of reasons. First, because of the scope of the regulation - nearly 10,000 fleets which include about 180,000 vehicles, ARB simply does not have the resources to receive, process, evaluate, modify, and enforce potentially thousands of alternative compliance plans. While ARB has allowed alternative compliance plans for other regulations such as the cargo handling equipment regulation and, while some fleets covered by the regulation may own other diesel vehicles and equipment that they would like to preferentially control relative to the vehicles covered by the regulation, staff does not believe that approach will be workable for the off-road rule. In addition, an alternative compliance plan is not feasible because to be effective, there must be "surplus" or "more easily controlled" emissions reductions to pursue that are otherwise uncontrolled. But, as ARB continues to develop strategies to reduce emissions from all in-use diesel engines and vehicles in the state, the opportunity to include such vehicles and equipment becomes significantly limited.

In any event, even if staff made the change proposed by the commenter, for the example cited above, it is unclear whether or not the commenter could, as a practical matter, substitute locomotive emissions reductions for off-road vehicle emission reductions. To date, ARB has entered into a number of enforceable Memorandums of Understanding with both Class I railroads operating in California to significantly reduce locomotive emissions, including switcher locomotives at rail yards. Staff anticipates further discussions with the Class I railroads and other stakeholders in the future to seek additional emission reductions from locomotives and railroad operations.

6)k)vii)4) Allow BACT or Fleet Average

- 1. Comment:** Amend the language to offer the fleet operator either a BACT or a Fleet Average option, effectively removing the retirement requirement. (BNSF)

Agency Response: A fleet is allowed to comply with the regulation by fulfilling the BACT requirements, or by meeting the fleet average targets each year; a fleet is never required to retire their vehicles. Under the NOx BACT requirements, a fleet may retire, replace, or repower 8 percent of their total fleet horsepower to meet the turnover requirements for that year (this increases to 10 percent after 2015). We do not recommend removing the requirement for accelerated turnover for fleets that do not meet the NOx targets because that would forego the NOx reductions of the regulation. For the PM BACT requirements, a fleet must install PM VDECS on 20 percent of their total fleet horsepower for that year. If a fleet chooses to meet the NOx or PM fleet average targets, they may do so by any means (i.e., any combination of VDECS and fleet upgrades allowed under the regulation may be performed). Additionally, a fleet may do a combination of BACT and fleet target compliance for PM and NOx in one year, and then subsequently change compliance paths the following year. For example, in 2010, a fleet can choose to meet the NOx fleet average targets and the PM BACT requirements, and then the next year, they could switch and choose to meet the NOx BACT requirements, and the PM fleet average targets.

6)k)vii)5) This section intentionally left blank

6)k)vii)6) This section intentionally left blank

6)k)vii)7) This section intentionally left blank

6)k)vii)8) Have Different Requirements for Fleets with High Horsepower

1. **Comment:** We do not fit the model used to develop these proposed regulations. Our average horsepower per machine is three times larger than the model. The proposed rule makes key assumptions about the average horsepower (hp) of a “typical fleet.” For mining on the scale that we operate, we must utilize very large horsepower equipment, on average 397 hp, and as high as 870 hp for our haul trucks and loaders. This is significantly higher than the ARB is assuming for an average construction fleet of this size (average 105 hp in the workshop example), and it is due entirely to the fact that quarrying is fundamentally different than road or building construction. The higher the horsepower, the more expense is involved, and the scale is more exponential than linear. We believe that the proposed rule thus fails to properly model the economic impact of the rule on quarrying operations such as ours. The impact on us is significantly greater than assumed for the typical construction fleet. In addition, our quarrying activities require a variety of equipment, some of them with low utilization hours. It is important to note that replacing our existing haul trucks and loaders will increase the horsepower of each individual piece of equipment (existing haul truck 870 hp, new haul truck 1000 hp; existing loader 690 hp, new loader 800 hp), raising our fleet average. (BMM1) (BMM3)

Agency Response: We recognize that this regulation will be more costly for some fleets to implement than others, and the challenges presented above are not unique to quarrying operations. For example, many construction fleets have high horse-power, relatively long-lived vehicles, such as scrapers and bulldozers. We acknowledge that compliance may be more difficult and expensive for such fleets. However, with the exception of vehicles that operate exclusively in agricultural operations, which will be covered by a separate regulation, the Board, in approving the regulation, determined that it is necessary and appropriate to have the regulation apply to all off-road diesel vehicles that operate in California, regardless of size, and that the regulation is cost-effective.

Even though the regulation is cost-effective, there remain a number of situations where the potential emission reductions are not cost-effective to achieve (typically because the vehicle is not used much). To address that, the regulation has a number of provisions that provide special consideration for vehicles with low utilization hours. Vehicles that operate less than 100 hours per year are defined as low-use vehicles and are exempt from all the regulation's performance requirements. In addition, the hours in fleet average provisions in the regulation allow fleets to give more weight in their fleet average to the vehicles that operate the most and to target their compliance dollars toward those vehicles.

Finally, staff does not agree with the commenter's conclusion that the purchase of trucks and loaders with higher horsepower than the vehicles they replace will increase the fleet emissions average. Under the regulation, the fleet average is calculated by multiplying each engine's horsepower by its emission factor (EF), adding the resulting products for all fleet engines together, and then dividing that sum by the sum of the horsepower of all engines in the fleet. This is shown in the following equation.

$$\text{Fleet Average} = \frac{\text{sum of (hp} \times \text{emission factor)}}{\text{sum of hp}}$$

Because the horsepower appears in the numerator and denominator, replacing a vehicle with a higher horsepower vehicle will not increase the fleet average. Regardless of the horsepower, if the new vehicle's emission factor is lower than the replaced vehicle, the fleet average will decrease.

For additional discussion regarding cost and affordability of the regulation, see the responses in section 3)a) of Chapter III-A-3 of this FSOR.

6)k)vii)9) Economic Hardship Exemptions

1. **Comment:** We would suggest an economic off-ramp for hardship. And this could be done relative to some criteria that we could work out with ARB. (SCAQMD4)

- 2. Comment:** CARB needs to include a safety valve in the regulations for adverse economic circumstances. (FAUCHIER1)
- 3. Comment:** Allow some sort of relief language for complying if a recession becomes evident. I can guarantee you that during the recession of the early 70's, 80's and 90's, no equipment purchases or upgrades happened at Delta. The focus during these times is pure survival. (DCCI)
- 4. Comment:** Provide language, that on a case-by-case basis, a business could apply to ARB for an extension based upon limited financial resources and other local circumstances. (NEVADA)

Agency Response: We recognize that compliance with the regulation will be challenging for many fleets. During the development of the regulation, we struggled to find a way to build economic hardship into the regulation. However, we were not able to find a workable way of doing that for the following reasons:

- 1) One of the largest sectors covered by the regulation is the construction industry, which is by its nature a cyclical business. A significant percent of construction firms fail each year, but even a number of financially sound construction companies may experience a lack of profitability or other financial problems at certain times. We did not want to structure the regulation in a way that would potentially excuse a large number of firms from compliance due to economic downturns that are part of the normal business cycle
- 2) ARB does not have resources or expertise to review the financial situation of each of the nearly 10,000 fleets affected by the regulation, nor make a judgment as to whether their financial resources are adequate to pay for compliance.

However, at the July 26, 2007 Board meeting, the Board directed staff to add a provision intended to soften the impact of the regulation on fleets during periods of economic distress when fleets are downsizing. The Board directed staff to modify the regulation to provide that, on or after March 1, 2009, a fleet that permanently retires a Tier 0 vehicle from service within California may count that vehicle in meeting both the diesel PM BACT requirements and the NOx BACT requirements. Thus, a fleet that is downsizing can comply with the regulation without being required to do any additional turnover or retrofitting. We made this change in the First Notice of Public Availability of Modified Text and Availability of Additional Documents, which was released on December 11, 2007. This new section is located in section 2449.2(a)(2)(A)1.b., "Retirement of Tier 0 Vehicles in Lieu of Retrofitting for Fleets with Reduced Horsepower".

6)k)vii)10) Require Retrofit of Tier 0 until Tier 4 Available

- 1. Comment:** We have supplied data to show that the actual cost of compliance is 33 percent to more than 100 percent higher than the staff estimates. We have shown staff that by allowing us to keep our tier 0 equipment in our fleet until tier 4 technology is available, then phasing this equipment out of our fleets we would achieve by retrofitting with level 3 VDECS and retrofitting at a rate of 10% a year a 50% reduction in PM emissions in the first 4 years of compliance. We ask your Board to consider our plan, it is fast and more cost effective way to achieve the largest reduction in PM emissions. (CAMARILLO4)

Agency Response: We expect that each fleet will evaluate various compliance strategies before choosing the most effective strategy for its particular situation, and that costs of compliance will vary among fleets. We agree that retrofitting Tier 0 vehicles early during the regulation's implementation, keeping them until Tier 4 vehicles are available, and then replacing them with Tier 4 vehicles could be a promising strategy for many fleets. For example, if a fleet retrofits all its Tier 0 vehicles in 2010, the regulation will give each retrofitted vehicle a guaranteed six-year life during which it would be exempt from turnover requirements. This would carry the fleet through to 2016, at which time Tier 4 vehicles will be available for purchase in all horsepower groups. In recognition of this, the regulation was designed to allow fleets to choose this compliance strategy.

Staff did not require the approach of retrofitting all Tier 0 vehicles first because it may not be the most appropriate or cost-effective strategy for all fleets. The viability of this particular approach is dependent on the type of vehicles in a fleet, and the availability of level 3 VDECS for a fleet's vehicles. We also recognize that some fleets may prefer to turn over vehicles rather than utilize retrofits, and we wanted to build in flexibility for fleets to choose that option. However, in all cases, the actions taken by fleets to comply with the regulation will provide significant emission reductions in both diesel PM and NOx over the life of the regulation.

Instances where fleets estimated different costs of compliance than staff are addressed in the response to comment III-A-3)d)i) of this FSOR.

The reasons staff included a 20 percent per year rather than 10 percent per year retrofit requirement under the PM BACT provisions are discussed in the response to comment III-A-6)k)vii)2) of this FSOR.

6)k)vii)11) This section was intentionally left blank.

6)k)vii)12) Implement a Yearly Cost Cap

- 1. Comment:** I think what you should do is to consider placing a cap on the cost. Give an example. For a large fleet, the maximum I should have to

spend is \$180 per horsepower per year. I think that would be great. And I think you ought to set a cap there, because I'm currently spending \$330 per horsepower. That is strictly a repower of my equipment. That does not include a diesel particulate filter, which is an additional \$51 per horsepower. I would like to make sure that you just go ahead and cap it, and we will not have a cost that's greater than three billion. (NWS3)

2. **Comment:** I would like to focus your attention on page 3 and 4 of the overview and staff recommendation, which is the first section of the rule. This section is important because it represents to you, the CARB Board, and to equipment owners what the CARB staff believes the cost of compliance to the rule will be. In the last paragraph on page 3 it states, "Annual costs for a typical fleet would range from \$8 to \$9 per horsepower per year." Staff is stating with certainty to the CARB Board and the public and the equipment owners that the cost of compliance for a typical fleet is no more than \$8 to \$9 per horsepower per year. Furthermore, on page 4, paragraph two it says, "Overall, most affected businesses could absorb the cost of the proposed regulation with no significant adverse impacts on their profitability." If the maximum cost was capped at no more than \$9 per horsepower per year, the cost would be a hardship but doable. (DER4)
3. **Comment:** I want to appeal to you on behalf of our small business and on behalf of the entire industry. In the last year which we had completed income tax returns, our very best year for revenue and profit, we had after tax incomes of a little over \$1 million. All of those after-tax profits were used to make down payments and principal on late model and lower emission equipment. The rule as written will cost our company \$2.4 million a year. That is \$1.4 million a year more than we made in our very best year. We truly believe that for this rule to be feasible the cost to owners must be capped at the level CARB staff projects it to be, that level of \$9 per horsepower per year maximum. (DER6) (DER3)
4. **Comment:** Where a fleet average is not met, the proposed regulation requires retrofit where "feasible". But feasibility is not clearly defined. With enough time and money almost anything can be done. Some type of cost cap on a \$/hp basis should be included that defines feasible/infeasible and accounts for the ability of companies to absorb those costs. (CBIA)

Agency Response: We disagree that an annual cost cap should be included in the regulation. As discussed further below, a cost cap could change the manner in which fleet owners comply with the regulation, significantly reducing the emission reduction benefits of the regulation.

We believe a cost cap would encourage fleet owners to meet the yearly cost cap by actions that provide the most benefits to the fleets, rather than by pursuing the actions that are most efficient at reducing emissions. For example, under a yearly cost cap, fleet owners could replace a few older vehicles each year and meet the cost cap, while neglecting repowers, retrofits and other cost-effective actions that would produce a much larger reduction in emissions per dollar spent. With a cost cap, many fleets would likely see little more emission reductions than they would from natural turnover of fleet vehicles.

A cost cap would also be unworkable because of the difficulty in establishing the normal turnover that would have occurred in the absence of the regulation; which is necessary in determining how much has been spent complying with the regulation. As discussed further in the response in section 3(d)i) in Chapter III-A-3 of this FSOR, there is a discrepancy between how ARB estimated cost and in how different fleets view their compliance costs. Many fleets included the cost of vehicles they would have purchased anyway due to normal turnover in the cost they attributed to the regulation. If fleets did that and the regulation included a cost cap, many fleets might attempt to demonstrate they had reached the cap by purchasing vehicles that would have been purchased even in the absence of the regulation. ARB would then be forced to debate each fleet's normal turnover practices, which would be time consuming and ultimately unproductive both for ARB and for fleets.

The Board recognized that the cost of compliance will vary by fleet, and may be greater than projected for certain fleets. This is particularly true for fleets with older vehicles that produce more emissions than the average fleet. However, ARB does not believe an appropriate solution is promoting actions that will not achieve the greatest emissions reduction benefit for the cost.

The Executive Officer will determine the feasibility of retrofits and repowers by the availability of the devices and engines, and whether or not they may be installed safely. If a retrofit or repower is not available or safe, an exemption may be granted to the vehicle once all other feasible actions to lower emissions from the fleet are taken.

6)k)vii)13) Regulate OEMs to Ensure Viable Equipment is Available

- 1. Comment:** We think that ARB staff needs to put their foot down on the original equipment manufacturers (OEMs), and mandate some dates to get this equipment available to the contractors so we can all make this work. (TC)

Agency Response: Both ARB and the U.S. EPA have established standards for new off-road engines which have required new engines to meet increasingly stringent emission standards since the mid-1990s, and which will continue to require even cleaner engines through 2015. The new engine standards are described further in section E of Chapter V of the Technical Support Document.

Please see also the response to comment III-A-6)a)i) of this FSOR for a discussion of why it is necessary to impose requirements on owners of in-use vehicles, rather than solely relying on regulating OEMs.

Please see also the responses in section III-A-2)b) and III-A-2)c) of this FSOR for a discussion of the availability of engines and vehicles necessary to meet the requirements of the regulation.

It was not clear from the comment whether the commenter was referring to new engines or retrofit solutions for existing engines. We interpreted the comment to refer to new engines. However, **Section 2)a)i) in Chapter 2** of this FSOR provides a discussion of why ARB thinks enough VDECS will be available and how ARB is helping facilitate the development of additional retrofits.

6)k)viii) This section was intentionally left blank.

6)k)ix) Regulation Not Flexible Enough

1. **Comment:** The problem with this rule is that it is unforgiving and inflexible. You can't turn over just 7 percent of your horsepower or repower just 19 percent. You have to do the 8 and the 20. Turnover and retrofit BACT percentage requirements should have some flexibility, so that some rounding or "getting close" is sufficient. (CBCC3)
2. **Comment:** The regulation has minimal flexibility. (CBIA)
3. **Comment:** The regulation needs to incorporate more flexibility in order for fleets to be able to minimize compliance costs. (MCQUEEN3)

Agency Response: In adopting the regulation, the Board attempted to incorporate as much flexibility as possible. In fact, as discussed further in Chapter III-A-5 of this FSOR, it provides so much flexibility and options for fleets that some stakeholders have complained that it is difficult to understand and plan for compliance. Some of the exemptions and flexibility provisions are listed here: Fleets have the choice of complying with fleet average targets or BACT requirements each year. Fleets need never do more than the BACT maximum turnover and retrofitting in any year.

Specialty vehicles under certain circumstances are exempt from mandatory turnover, as are vehicles less than 10 years old, and vehicles that have been retrofitted with a level 2 or 3 VDECS that was highest available VDECS at the time of installation.

Vehicles with Tier 1 engines or higher are exempt from mandatory turnover requirements until March 1, 2013, provided that all Tier 0 vehicles that do not qualify for an exemption have been retired.

There are provisions for alternatively-fueled vehicles, including gasoline and electric, and equipment such as conveyor systems, replacing diesel powered vehicles.

Vehicles are exempted from the performance requirements if they are low-use.

Vehicles used exclusively for personal use are exempt from this regulation.

Vehicles used exclusively for agriculture, including forestry operations, are exempt from this regulation, and if they are used more than half-time, they are exempt from the performance requirements of the regulation.

Vehicles used exclusively for snow removal and emergency operations are exempt from the regulation.

Many of the flexibility condition were in the regulation prior to the Board Hearings, although some were added after as result of testimony through the 15-day changes. To create additional provisions beyond what exists today, along with accompanying restrictions and exemptions, would add length and complexity to the regulation and implementation. Additional flexibility could also diminish the emissions reductions achieved.

We understand the desire expressed in comment CBCC3 for fleets to be considered in compliance if they come close to meeting the regulation's requirements. However, a regulation that did not set specific targets would be difficult to enforce. Per section 2449(k) Penalties, however, ARB staff will take into account the magnitude of noncompliance when determining any potential penalties for noncompliance. A fleet that comes very close to meeting the requirements will receive lower penalties than one who does not.

The affordability of the regulation is addressed in the responses in section 3)a) of Chapter III-A-3 of this FSOR.

6)k)x) This section was intentionally left blank

6)k)xi) Clarify Language

- 1. Comment:** The regulation states, "...engines equipped with a diesel particulate filter and Tier 4 final engines" are exempt from PM retrofit requirements. This passage should be improved as it could be misinterpreted. For engines 750 hp and smaller, there is no interim Tier 4 PM standard or the interim Tier 4 PM standard is the same as the final. Also, the term particulate filter is redundant because Tier 4 engines will have some form of highly efficient PM control, whether or not they have a filter. (CBIA)

Agency Response: Regarding vehicles equipped with exhaust devices, and Tier 4 Interim and Tier 4 final engines, staff believes the regulation is clear on which vehicles are exempt from BACT retrofit requirements. These vehicles are exempt from the retrofit requirements if the vehicle meets one of the following conditions in 2449.2(a)(2)(A)4.c. and d., which read:

- c. The engine in the vehicle is equipped with an original equipment manufacturer diesel particulate filter that came new with the vehicle, or
- d. The engine in the vehicle was already retrofit with a Level 2 or 3 VDECS that was the highest level VDECS available at time of installation. An engine with a Level 2 VDECS that was not the highest level VDECS at time of installation does not qualify for this exemption.

Note that it is unknown at this time whether engine manufacturers will need to equip engines between 25 and 99 horsepower with diesel particulate filters in order to meet the Tier 4 Interim PM standards.

Finally, the commenter is incorrect that horsepower groups other than greater than 750 hp do not have interim Tier 4 standards or have interim Tier 4 standards identical to the final Tier 4 standards. As illustrated in Table V-3 in the Technical Support Document, all horsepower groups for engines 25 hp and up have interim Tier 4 standards, and for engines 25 to 49 and 50-74 hp, the interim Tier 4 PM standard (0.22 g/bhp-hr) differs from the final Tier 4 PM standard (0.02 g/bhp-hr).

6)k)xi)1) Clarify that BACT is Compliance

1. **Comment:** It is not clear in the regulation that a fleet complying with BACT is in compliance. Clarification should be added to the regulation to avoid ambiguity and potentially costly legal disagreements. (CALCIMA)

Agency Response: The regulation clearly states that a fleet is in compliance if it complies with BACT requirements for a particular year. We do not believe further clarification is needed. In several locations, the regulation says that every year a fleet must meet the fleet average requirements or demonstrate that it met the best available control technology (BACT) requirements. In addition, the Technical Support document on page 71 states that the PM and NOx requirements can be satisfied in each compliance year by demonstrating the best available control technology (BACT) requirements or the fleet average targets have been met.

6)k)xii) Compliance Extension for Equipment Failure

1. **Comment:** There should be compliance extensions for manufacturer delays in providing replacements for equipment that has been damaged or has failed (both during the and outside the warranty period). The current rule's compliance extension for manufacturer delays applies only to new vehicles or new VDECS equipment, and requires that the new equipment

be purchased 6 months prior to a compliance deadline. The current provision for VDECS failure or irreparable damage requires that a replacement be obtained within 90 days, without exception. Compliance flexibility should be granted for manufacturer delays in providing replacement equipment or subsequent failure of replacement equipment as well as new equipment. (LACITY)

Agency Response: We agree and, in the first Notice of Public Availability of Modified Text and Availability of Additional Documents, added language to section 2449(e)(6) so that for a VDECS purchased to replace a failed or damaged VDECS, if the replacement VDECS is unavailable within 90 days due to manufacturer delay, to remain in compliance the fleet owner and seller must enter into contractual agreement for the purchase within 60 days of the VDECS failure. (In addition, a change was also made so that new equipment or vehicle purchase, or the fleet owner and seller had entered into contractual agreement for the purchase, the lead time has been reduced to at least four months prior to the required compliance date.)

6)k)xiii) This section was intentionally left blank

6)k)xiv) ARB/City Liaison

1. **Comment:** Local governments need to comply with the requirements of the regulation. We recommend that ARB assign a local government liaison who is available to the municipalities as a technical resource to assist with implementation issues as they arise. (LACITY)

Agency Response: Staff agrees with the commenter on the need to assist affected fleets with compliance and implementation issues with the regulation, but does not believe it necessitates any change to the regulatory language. Staff recognizes that having a liaison between the municipalities and ARB would assist with the implementation process and help address issues related to compliance requirements of the regulation. ARB will address this issue during the implementation process.

6)k)xv) This section was intentionally left blank

6)k)xvi) Transfer of Fleet Ownership

1. **Comment:** In section 2449(d)(6) Fleet Ownership Transferred, it concludes that a fleet owner who is meeting the fleet requirements through averaging can purchase a fleet meeting the requirements through BACT and continue to meet the requirement for both fleets using averaging for one and BACT for the other until the next reporting date. On the next reporting date, the fleet owner would be required to combine the fleets and decide which method of compliance they will use henceforth for

the combined fleet. Is this a correct interpretation of this provision?
(ARA2)

Agency Response: Yes, that is a correct interpretation.

6)k)xvii) Do Not Require Tier 4 Engines to Have a non-OEM VDECS

- Comment:** Tier 4 engines should never require non-OEM VDECS.
(ARA2)

Agency Response: Section 2449.2(a)(2)(A)4. of the regulation states that an engine equipped with an original equipment manufacturer diesel particulate filter that came new with the vehicle is exempt from the retrofit requirements of the regulation, provided the fleet qualifies for use of the retrofit exemptions . Since the vast majority of Tier 4 engines are expected to come new with an OEM diesel particulate filter, we expect the vast majority will be exempt from the retrofit requirements.

We do understand it is likely that a number of Tier 4 engines may be produced and sold that do not come equipped with a diesel particulate filter. Because these engines will meet the Tier 4 PM standards, it is very likely that fleets will be able to avoid retrofitting these vehicles through the final target date by meeting the PM fleet average targets. While we acknowledge that these engines would meet the Tier 4 certification emission standards, it is important that every vehicle have a Level 3 diesel particulate filter to ensure that we are reducing exposure to all sizes of particulate, including fine particulate, which will not be effectively controlled without the use of a diesel particulate filter. The regulation therefore includes a requirement at section 2449(d)(10) that fleets that meet the PM fleet average but have vehicles (including vehicles that have Tier 4 engines) that do not have diesel particulate filters installed retrofit those vehicles with diesel particulate filters by March 1, 2021 for large and medium fleets, and by March 1, 2026 for small fleets.

See also the response in section III-A-2)a)v) of this FSOR for a discussion of how we expect many OEMs to develop retrofits for their own engines and vehicles.

6)k)xviii) This section was intentionally left blank

6)k)xix) Expand Extension for Availability of Tier 4 Engines

- Comment:** The provision affording Compliance Flexibility for Delays in Availability of Tier 4 Vehicles (see Proposed Section 2449(e)(9)) should also allow the Executive Officer to provide a compliance extension in the event of GSE performance, reliability, or safety problems caused by ... new Tier 4 equipment. Simply because a[n] engine is nominally “available” does not mean that it will function in GSE without causing performance, reliability, or safety problems. GSE performance, reliability, or safety

issues will impair the ability to move aircraft safely and efficiently through the gate and into the runway queue on schedule --causing delay or compressed take offs and landings. These effects ripple throughout the country, impairing the safe and efficient operation of both the airport in question and the National Airspace System. Nor does the current proposed Rule address ... any issues caused by Tier 4 engines. (POHLE)

Agency Response: Staff believes the existing language regarding delays in the availability of Tier 4 vehicles gives the Executive Officer sufficient ability to grant extensions if there are delays in availability of Tier 4 vehicles for GSE applications. When determining availability, the Executive Officer may consider performance, reliability, and safety issues.

Section 2449(e)(9) of the regulation states the following:

"Compliance Flexibility for Delays in Availability of Tier 4 Vehicles - If the Executive Officer finds that there is a delay in availability of vehicles with engines meeting the Tier 4 interim or final emission standards so that vehicles with Tier 4 interim or final engines to meet a fleet's needs are not available or not available in sufficient numbers or in a sufficient range of makes, models, and sizes, then the Executive Officer may grant an extension to the fleet from the requirements in sections 2449.1(a)(1), 2449.2(a)(1), 2449.1(a)(2) and 2449.2(a)(2). If such a delay affects a group of fleets, the Executive Officer may issue an extension to all fleets with certain characteristics. Any such delay must be documented based on verifiable information from the fleet regarding its vehicle needs and/or verifiable information from the equipment manufacturer, engine manufacturer, distributor, and/or dealer regarding the unavailability of appropriate vehicles with Tier 4 interim or final engines."

6)k)xx) Fleet Average Calculation

- Comment:** We run some Tier 1, 2, and 3 engines which, due to the fact that they were introduced AHEAD of the required deadline, get penalized one tier level in the CARB fleet average formula. (ECCO2)

Agency Response: In the first Notice of Public Availability of Modified Text and Availability of Additional Documents, we revised the regulatory language to allow such engines to count as the actual tier to which they were certified. Please see the introductory language to Appendix A: "For an engine certified to an emission standard lower than that shown in these tables for its model year, the emission standard to which the engine is certified may be used, provided that the certification Executive Order or certificate number is provided along with the initial and annual reporting required by section 2449(g)(1) and 2449(g)(2)."

6)k)xxi) Modify the Time Afforded to Address VDECS Failures

- 1. Comment:** The proposed Rule provides only 90 days to address failure or damage of a VDECS, which is likely to be insufficient. See Proposed Section 2449(e)(l). Even if GSE fleet owners were able to solve the technical feasibility and other issues associated with attempting to retrofit GSE in the first instance, 90 days is an inadequate amount of time to order, receive, and re-install a retrofit (particularly on highly specialized GSE, where chassis space may be limited, and there is significant reengineering performed to allow initial installation). At a minimum, the time to address VDECS failures should be increased to 180 days.
(POHLE)

Agency Response: We disagree that the time to address VDECS failures should be increased to 180 days. To replace an existing VDECS should take no longer than six to eight weeks, even during a back log period. If in a rare instance, there is a delay beyond 90 days, fleets can take advantage of the provisions in section 2449(e)(6)(A) that provide that a fleet owner who purchases VDECS to comply with this regulation is excused from immediate compliance if the VDECS has not been received due to manufacturing delays as long as the fleet owner and seller had entered into contractual agreement for the purchase within 60 days of the VDECS failure.

The Mobile Cargo Handling Equipment at Ports and Intermodal Rail Yards regulation (13 CCR § 2479) contains the same VDECS failure provisions, such that:

(g) Diesel Emission Control Strategy Special Circumstances

An owner or operator shall maintain the original level of the elected Compliance Option for each engine once that engine is required to be in compliance, and is not required to upgrade to a higher level of Compliance Option, except under specified special circumstances, as follows:

(1) In the event of a failure or damage of a diesel emission control strategy, the following conditions apply:

(A) Failure or Damage during the Warranty Period. If a diesel emission control strategy fails or is damaged within its warranty period and the diesel emission control strategy manufacturer or authorized dealer determines it cannot be repaired, the owner or operator shall replace the diesel emission control strategy with either the same level diesel emission control strategy or another approved Compliance Option as defined in subsection (e)(3) within 90 days of diesel emission control strategy failure.

(B) Failure or Damage Outside of Warranty Period. If a diesel emission control strategy fails or is damaged outside of its warranty period, and it

cannot be repaired, the owner or operator shall apply a Compliance Option within 90 days, as defined in subsection (e)(3).

The commenter expressed concern regarding initial installation issues. In order to allow time to discover potential issues with the installation of VDECS on specific equipment types, the definition of "Highest Level Verified Diesel Emission Control Strategy" in section 2449(c)(27) includes the provision that a VDECS will only be considered a highest level VDECS available if it has been verified by ARB at least 10 months prior to the date that a fleet must install the VDECS to be in compliance with the PM retrofit requirements of the off-road regulation. There are also provisions in the regulation to ensure that the retrofit requirements do not impair the safe operation of a vehicle due to installation of a VDECS. In addition, the regulation allows a fleet owner to appeal an independent hearing officer an Executive Officer's determination that a VDECS does not impair the safe operation of a vehicle. The procedure for determining whether a VDECS is safe is discussed further in the response in section III-A-2)a)ii)1) of this FSOR.

We acknowledge that the verification process does not address the technical feasibility, extent of vehicle redesign, necessary lead-time, cost, and other issues involved in installing a retrofit into a particular vehicle; nor would that be appropriate. The verification procedure is discussed in more detail in the response to comment III-A-2)a)iii)2) of this FSOR. The inclusion of GSE testing in the verification procedure is discussed further in the response in section III-A-2)a)xx) of this FSOR.

6)k)xxii) Revise the Compliance Extension Provisions

- 1. Comment:** Section 2449(e)(6) - Compliance Extension for Equipment Manufacturer Delays This section provides an open-ended extension where the operation or installation of new equipment or vehicles could be extended indefinitely due to manufacturer delays. We strongly recommend that this section be revised to only allow a maximum of 30 days delay in operating or installing the new equipment or vehicles due to manufacturer delays. In signing contractual agreements with the manufacturers, the manufacturer should be held liable for any delays longer than 30 days. Under such circumstances, the manufacturers will be required to provide alternative equipment or vehicles capable of achieving the equivalent reductions. (SCAQMD1)

Agency Response: We disagree. Attempting to impose penalties on a manufacturer or to force them to provide alternative equipment would not be practical. Manufacturers will already have a strong incentive to deliver their product on time so they can be paid. The regulation only grants an extension when the fleet owner has entered into a contractual agreement with the vehicle manufacturer and the manufacturer is not able to deliver. Manufacturer's delays are outside the fleet owner's control. Requiring the fleet owner to incorporate

liability clauses against the equipment manufacturer in the event of a delay would introduce an unacceptable level of complexity both in the contractual obligations of the parties and in the enforcement of the regulation. We anticipate that vehicle manufacturers will be able to meet the demand for new vehicles and equipment and therefore we do not expect this section to be invoked to any significant measure; this section does however, provide necessary protection for fleet owners should they not receive their purchased vehicle or equipment.

2. **Comment:** Section 2449(e)(9) - Compliance Flexibility for Delays in Availability of Tier 4 Vehicles - This section allows the Executive Officer to grant extension to the fleet in meeting their requirements for any delays in the availability of Tier 4 equipment. We strongly recommend that this section be revised to establish additional criteria before any such extension can be granted. Such criteria should at minimum include a demonstration by the operator that: 1) Equipment meeting Tier 4 emissions levels are absolutely necessary to meet the turnover and target requirements for a given year; and 2) retrofit control devices capable of achieving equivalent reductions are not available. (SCAQMD1)

Agency Response: We disagree. The regulation's emissions targets were developed with the expectation that vehicles with Tier 4 engines would be available to the fleet owner. Should Tier 4 engines not be available, we believe it is reasonable to grant a compliance extension to the fleet owner. However, we anticipate that Tier 4 vehicles will be available in sufficient quantities to meet the needs of fleet owners.

Regardless, it is left to the Executive Officers discretion whether to grant an extension. Any request for an extension must include documentation from the fleet owner of its need for Tier 4 vehicles.

7. Greenhouse Gas Impacts

7)a) Should Assess Greenhouse Gas Impacts

1. **Comment:** Greenhouse gas (GHG) issues were not considered. (CIAQC7)
2. **Comment:** The added fuel consumption from electrical regeneration of VDECS and due to VDECS will result in an industry wide increase in greenhouse gas contributions. (CIAQC7)
3. **Comment:** The reduction in black carbon, NOx, and CO2 emissions will reduce global warming. (UCS1)
4. **Comment:** The impact of the regulation on CO2 emission should be assessed. (CBIA)

5. **Comment:** An opportunity to achieve further greenhouse gas reductions does exist from this rule, especially for airport ground support equipment (GSE). The current proposal gives additional credit for using zero emission vehicles (ZEV) in place of diesel powered equipment, but does not require it. While the potential GHG reductions would have been relatively small from an airport GSE ZEV requirement, there is sufficient technology availability for this type of requirement. (UCS1)

Agency Response: As discussed in the Chapter VI of the Staff Report, although some actions required by the regulation would slightly increase carbon dioxide (CO₂) greenhouse gas emissions because they have a fuel economy penalty impact on fleets, the regulation reduces black carbon emissions, which contribute to global warming. Also, the regulation reduces unnecessary idling and gives credit for the use of electric vehicles; both actions would reduce greenhouse gas emissions. Thus, on the whole, staff expects the regulation to have a negligible effect on global warming.

As discussed in Chapter IX of the Technical Support Document (TSD), it is difficult at this time to estimate the impacts of reductions of these pollutants on climate change. The U.S. EPA did not estimate climate-associated benefits for the new Tier 4 standards for nonroad diesel engines since there is no global warming potential yet assigned to black carbon as there are for gases such as carbon dioxide, methane, and nitrous oxide. The U.S. EPA also stated that it would be important to characterize all of the effects of the rule on climate, including tropospheric ozone and fuel economy, but the methods to conduct such an assessment are not available.

7)b) Address Global Warming First

1. **Comment:** Delay the regulation until such time that all pollution problems, including global warming, can be addressed. The regulation will need to be revamped later to address global warming. (McNally)

Agency Response: As discussed in the response immediately prior to this one, staff expects the regulation to result in a negligible effect on global warming. As discussed in Chapter III-A-1 of this FSOR the need for this regulation to address NOx PM2.5 and the risks associated with diesel PM is immediate, and for that reason the regulation should not be delayed.

2. **Comment:** We believe there is additional untapped potential for reducing GHGs from off-road equipment, and the evaluation of GHG reduction opportunities was not an integral part of the rule development process. We support that the focus of this measure is achieving health benefits through reduction for NOx and PM emissions, and development started well before the passage of AB 32. However, future regulation or those

currently under development should include analysis of technology and operational strategies specifically directed to achieve GHG reduction and GHG reduction measures should be included in the regulatory requirement of each measure when feasible. (UCS1)

Agency Response: As the commenter noted, staff did not evaluate GHG reduction opportunities during the development of this rule. Therefore, staff cannot ascertain the economic or technical feasibility of reducing GHGs from off-road equipment.

Now that Assembly Bill (AB) 32 has been adopted directing ARB to address greenhouse gas emissions, the ARB will consider GHG emission impacts and opportunities to reduce GHGs in future regulation.

8. Consideration of Alternatives

8)a) Thoroughness of Consideration of Alternatives

1. **Comment:** Alternatives were not really considered: AGC challenges the... alternatives analysis of ARB's proposed standard. ARB's ISOR Section XI describes the alternatives to the regulation that ARB considered and why they were rejected in favor of the proposed regulation. AGC maintains that ARB has failed to consider a variety of less costly and reasonable alternatives to its proposal that would improve air quality in California. (PILCONIS) (AGCA3)
2. **Comment:** Have you done any research into what is available as an alternative to this plan? There is a diesel catalytic converter that has been invented that completely cleans the exhaust and with a minimum of expense to the small owner/operator. BUT BIG business would not make as much money with that. (EVANS1)

Agency Response: We disagree that ARB did not consider a wide variety of alternatives when developing the regulation. We seriously considered numerous alternatives during the three-year development of the regulation, and thoroughly analyzed potential alternatives' effect on emissions reductions and cost.

The Technical Support Document (TSD) for the regulation in Chapter X: Alternatives Considered describes five alternatives to the regulation that were considered, and the reasons staff did not recommend these alternatives. As described in the TSD, the alternatives considered ranged from taking no action, and allowing natural turnover and manufacturer requirements to reduce emissions, to increasing required turnover prior to 2015. The TSD description is intended to provide an overview of the alternatives considered, but is not intended to provide an exhaustive list of every possible change to the regulation considered and analyzed by the staff.

During the development of the regulation, staff considered and debated hundreds of potential changes to the regulation, including dozens of different potential versions of the fleet average targets. During the thirteen public workshops and eight workgroup meetings that were held throughout the state during regulation development, staff presented versions of regulatory concepts and regulatory language. After each set of workgroups or workshops, staff went back and modified the proposal based on the feedback received. So, each successive iteration of the regulatory concepts and language provided to stakeholders for review and comment was, in effect, an alternative presented for future consideration, even though it was not specifically identified as such in Chapter X of the TSD. Table III-A-8)a)-1 below lists workgroups and workshops at which versions of regulatory concepts and regulatory language were vetted.

Table III-A-8)a)-1 Public Meetings at which In-Use Off-road Diesel Vehicle Regulation Regulatory Concepts or Language Were Presented

Date	Alternative Development
Nov. 16 and 17, 2004	Preliminary concepts and approaches to off-road diesel equipment regulation presented http://www.arb.ca.gov/msprog/ordiesel/presentations/nov16-04_workshop_color.pdf
July 13 and 19, 2005	Initial regulatory concepts presented - Best Available Control Technology alternative presented http://www.arb.ca.gov/msprog/ordiesel/presentations/workshop_presentation07_13.pdf
August 30, 2005	Update on regulatory concepts presented http://www.arb.ca.gov/msprog/ordiesel/documents/wkgroup_agend_a8-30-05.pdf
Jan. 24 and 31, 2006	Third public presentation of regulatory concepts, including Fleet Average Path alternative http://www.arb.ca.gov/msprog/ordiesel/documents/OffrdWkshopPre_sn01-06.pdf
July 21, 2006	Fourth public presentation of alternatives and revisions to regulatory concepts, including lower limits on maximum required equipment turnover, lighter regulation on low use vehicle provisions, and delayed compliance dates for smaller and medium fleets. http://www.arb.ca.gov/msprog/ordiesel/documents/july_21_workgroup_mtng_presentation.pdf
Dec 18, 20, and 21, 2006	Fifth public discussion and presentation of regulatory development, including proposed regulatory language, and proposed reporting requirements. http://www.arb.ca.gov/msprog/ordiesel/documents/OffRoad_06-1215_Full.pdf
Feb 20, 23,	Sixth public presentation of proposals, including revisions and

26, and March 1, 2007	alternatives to exemptions, vehicles used out of state, and carryover credit for vehicle turnover. http://www.arb.ca.gov/msprog/ordiesel/documents/07-0220_Workshop_4pp.pdf
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Because of the volume of possible changes considered, it was not possible or desirable to present every possible alternative to the regulation in the TSD Chapter X description.

In addition, this chapter of the FSOR discusses many of the alternatives proposed by affected fleet owners in detail, including the Associated General Contractors of America proposal, the Air Transportation Association of America proposal, the Coalition to Build a Cleaner California alternative, the initial South Coast Alternative Plan, and numerous alternatives and amendments suggested by individual fleet owners.

ARB recognizes that many fleet owners would prefer a less stringent regulation in order to lower costs, but does not believe that the rejection of an alternative that would have lowered the emissions reduction benefits of the final regulation implies that the alternative was not considered. It bears mention that ARB also considered and rejected alternatives that would have made the regulation more stringent, but at a cost it believed would outstrip a general fleet's ability to absorb and pass on costs. See response to the South Coast Alternative Plan above.

8)b) Appoint Advisory Group to Craft Different Approach

1. **Comment:** Instead of adopting the regulation, the chairman should appoint an advisory committee made up of Board members, staff, owners, managers or employees from the construction industry (including demolition, grading and excavation, shoring, paving contractors and the like), environmentalists, and general public. Following discussions within the group the regulation can be modified to come up with a way to improve air quality, without any adverse effects on the construction industry. (CIAQC2) (EDWARD) (AGCA5) (TURNER)
2. **Comment:** Do not adopt the proposed regulation, but instead have discussions with the stakeholders and come up with a more feasible plan to reduce diesel emissions. Do it with less hardship and economic impact. The staff and the construction industry need to work together and come to a consensus. (AGCA5) (EDWARD) (CALPASC3)

Agency Response: We disagree with the commenters' suggestions that the regulation should not have been adopted and that an advisory group should be convened to craft a different approach. This would only serve to delay necessary emission reductions.

As part of the public process used by staff, the regulation was developed with extensive input from stakeholders. Since 2004, staff worked with members of the construction industry, other affected industries, local air districts, environmentalists, and other interested parties in developing the provisions of the regulation. Staff held 13 public workshops, six public workgroup meetings, and met with countless individual companies and organizations to discuss and draft the proposed regulation.

However, staff is committed to successful implementation of the regulation, and believes that successful implementation begins by working closely with stakeholders. Staff believes that an informal committee like that suggested by the commenters' could assist in implementing the regulation. On January 11, 2008, staff sent an invitation to all interested parties to apply for membership in the off-road implementation advisory group (ORIAG), which will represent a broad and diverse group of stakeholders and will include, but is not limited to air districts, construction industry (small, medium, and large fleets), environmental groups, engine manufacturers, emission control strategy manufacturers, and rental fleet owners. Staff will be looking to ORIAG for help with outreach, training, and implementation strategies, and to help make staff aware of the needs and opinions of stakeholders.

8)c) Regulate Manufacturers and Assess Fees on Old Vehicles

- 1. Comment:** ARB should propose realistic emissions reduction requirements that target equipment manufacturers with time frames that can be met. After a reasonable waiting period, and after manufacturers are able to produce equipment that complies with emissions requirements, you could begin to assess annual fees to contractors owning equipment older than a certain age. (CAULFIELD)
- 2. Comment:** Make all new equipment comply with Tier 3, and when Tier 4 equipment technology becomes available, make all new equipment comply with Tier 4. (CEI3)

Agency Response: As discussed previously, we believe the regulation contains realistic emission reduction requirements that can be met. We did not consider a regulation that would impose fees on owners of dirty vehicles in an attempt to disincentivize their use because we need to be certain the emission reductions will need will actually be achieved. One of the key drivers for development of the regulation was to reduce emissions of NOx and PM and to be able to claim those reductions in the State Implementation Plan (SIP). Under the federal Clean Air Act, in order for a regulation's benefits to be credited in the SIP, its emission reductions must be quantifiable and permanent. Staff does not believe that emission reductions associated with a regulation that allowed fleets to choose to either reduce emissions or pay a fee to emit would be quantifiable or as effective as what is currently required in the regulation.

As discussed previously in the responses in section III-A-6)a)i) of this FSOR, ARB and USEPA already have new engine standards that have required manufacturers to produce increasingly cleaner engines and vehicles. See also the responses in section III-A-3)a) of this FSOR regarding why we believe the regulation is affordable.

8)d) Adopt a Different Alternative

8)d)i) CIAQC/CBCC proposal

- 1. Comment:** Construction Industry Air Quality Coalitions (CIAQC) and Coalition to Build a Cleaner California (CBCC) requested ARB to adopt the following alternative proposal. (CIAQC8)

A Coalition to Build a Cleaner California Alternative

Members of the Coalition to Build a Cleaner California have been working with CARB for more than three years on the development of this regulation. We believe there is a better way to achieve the desired emission reductions without the mandated annual emission limits proposed by CARB. In developing this alternative, our goals are simple:

1. Achieve better emission reductions for 2015 than the CARB proposal.
2. Keep the same starting date as the CARB proposal.
3. Require annual reporting to demonstrate progress toward the goal.
4. Provide maximum flexibility for contractors to reach the target.
5. Allow more time at the back-end for new Tier 4 engines to enter the fleet (estimated to be approx. 2014/2015).
6. Recognize the wide divergence in fleet sizes, emissions and capabilities.
7. Permit each fleet to determine how to best achieve the reductions.
8. Give credit to those fleets that provide early reductions for both NOx and PM.
9. Minimize the financial impact to keep the most firms in business.
10. Maintain a highly competitive bidding environment.

The Coalition proposal would have each contractor establish individual fleet emissions and fleet inventories in 2009, the same requirement contained in the current proposal. Starting points would be established in 2010 for large fleets, 2013 for medium fleets and 2015 for small fleets.

However, rather than establishing an annual fleet emission target, the alternative would establish a 2015 emission reduction goal as a percentage of the individual fleet emissions.

For large fleets, the 2015 NOx emission reduction goal would be 32.5% and the PM emission reduction goal would be 47.5% which is slightly more than the 31.23% for NOx and the 46.84% for PM set by CARB's proposal. Each contractor would have to report annually their progress toward the goal, but the required reductions would be a percentage of their starting point. Every large and medium contractor fleet would have the same percentage reduction requirement.

Some contractors would be able to reach the goal sooner than others and would have a head start on the 2020 goals of a 50% reduction in NOx and a 70% reduction in PM. Every large contractor would have to comply with the 2015, 2020 and 2025 goals. The 2025 goals would be a 62.6% reduction in NOx and an 84% reduction in PM for each fleet. Medium fleets would have to comply with the 2018, 2023 and 2028 goals and small fleets would comply with the 2020, 2025 and 2030 goals.

Small fleets would be subject to a similar approach for PM emission reductions only. Required PM reductions would be 35% in 2020, 70% in 2025 and 84% in 2030.

The advantage of this alternative is that contractors can manage their fleet in a fashion most suitable for their financial condition. It allows for a more practical 5-year business planning cycle and it provides each contractor with the flexibility to use the full range of options available such as repowering, retrofitting, replacing or retiring equipment as they see fit. It achieves the same emission reductions at each milestone but it allows each fleet to reduce emissions in direct relation to their total emissions and their starting point.

The most significant difference between the alternative plan and the CARB proposal is moving the 2020 goal for large fleets to 2025. Small and Medium fleets would also be given additional time. We believe that is necessary in order to allow more time for Tier 4 engines, which will not be available in most horsepower ranges until 2014/2015, to enter the market and be acquired by the contractors. Tier 4 engines will achieve all the emission targets without any further retrofitting. It is the most desirable engine and the CARB proposal assumes that roughly half of the California construction fleet will be made up of these engines. Even when these engines are available in the marketplace, it's highly unlikely that 100,000 engines can be introduced to the fleet in 5 years or less as envisioned by the CARB proposal. Additional time will be needed.

The Coalition alternative is designed to fit within the framework established in the draft proposal prepared by the staff. The following outlines the specific changes that would need to be made to the draft proposal to adapt it to the Coalition alternative.

Regulatory Premise

1. Based on the 2010 NOx Target and the 2020 NOx Target in the proposed regulation, CARB seeks to achieve a 62.6% reduction in NOx during this time frame.
2. Based on the 2010 PM Target and the 2020 PM Target in the proposed regulation, CARB seeks to achieve an 84.0% reduction in PM during this time frame.
3. The proposed regulation is too complicated and too prescriptive. It leaves the fleet owner very little flexibility in managing his fleet.
4. The construction industry has requested an additional five years to achieve the remaining 12.6% and 14% of NOx and PM reductions respectively required by the regulation for large and medium fleets primarily to allow more Tier 4 engines to become available for purchase in California.

5. The regulation would be simpler if it established required percentage reductions over time and let fleet managers decide how best to achieve the reductions.
6. The percentage reductions required should be the same overall as those currently envisioned by the regulation.
7. The regulation should have "benchmark" or "interim" requirements for emission reductions throughout the applicable regulatory period. Annual reports submitted by each fleet should include total emission reductions required necessary for the fleet to meet the upcoming compliance goal, the actions taken and reductions achieved to date toward that goal, and the percent of progress remaining to achieve goal.
8. Fleet operators should have to report each year, beginning in 2009, so that progress towards the emission reduction goals can be monitored. Each year, CARB should send a letter to all contractors after annual reports are submitted reminding them of their emission reduction obligations and penalties associated with non-compliance.
9. The 2009 report for each fleet should be used to establish fleet and statewide inventories only, not to establish the Start Points.
10. Fleet size should be revised to reflect the following:
 - Small Fleet = 2,500 horsepower or less (remove additional requirement to meet small business definition)
 - Medium Fleet = 2,501 horsepower to 10,000 horsepower.
 - Large Fleet = Greater than 10,000 horsepower.
11. Start Points should be established using the NOx and PM Index Calculations currently specified in the proposed regulation. For fleets achieving early reductions, the start point may be calculated based on the year the first early reduction occurred.
12. End Points should be calculated based on a percentage reduction from the Start Point.
13. Start Points and End Points will be unique for each fleet.
14. Small Fleets will continue to be subject only to the PM requirements of the regulation.
15. Compliance for all fleets shall be demonstrated as indicated in the table that follows:

Fleet Size and Emission Reduction Requirements

Year	Large		Medium		Small	
	NOx	PM	NOx	PM	NOx	PM
2009	<i>Initial Inventory Report - All Fleets</i>					
2010	<i>Establish Start & End Point</i>					
2011						
2012						
2013			<i>Establish Start & End Point</i>			
2014						
2015	<i>32.5% Reduction From Start Point</i>	<i>47.5% Reduction From Start Point</i>			<i>Establish Start & End Point - PM Only</i>	
2016						
2017						
2018			<i>32.5% Reduction From Start Point</i>	<i>47.5% Reduction From Start Point</i>		
2019						
2020	<i>50% Reduction From Start Point</i>	<i>70% Reduction From Start Point</i>				<i>35% Reduction From Start Point</i>
2021						
2022						
2023			<i>50% Reduction From Start Point</i>	<i>70% Reduction From Start Point</i>		
2024						
2025	<i>62.6% Reduction From Start Point</i>	<i>84% Reduction From Start Point</i>				<i>70% Reduction From Start Point</i>
2026	Maintain Rate	Maintain Rate				
2027	Maintain Rate	Maintain Rate				
2028	Maintain Rate	Maintain Rate	<i>62.6% Reduction From Start Point</i>	<i>84% Reduction From Start Point</i>		
2029	Maintain Rate	Maintain Rate	Maintain Rate	Maintain Rate		
2030	Maintain Rate	Maintain Rate	Maintain Rate	Maintain Rate		<i>84% Reduction From Start Point</i>
2031+	Maintain Rate	Maintain Rate	Maintain Rate	Maintain Rate		Maintain Rate

Other commenters wrote to ARB requesting that we adopt the CIAQC/CBCC alternative proposal. The CIAQC/CBCC alternative would keep construction contractors and workers on the job, result in the world's cleanest construction fleet, ensure the bidding environment is at its most competitive and construction costs are at the lowest possible, and move the Rebuild California bond program forward.

(CIAQC8) (CBCC) (HALL) (FAUCHIER2) (CEA) (BROWNR) (TERRELL2) (ABBS2) (WAKEMAN) (HUFF) (TURVEY) (FERMA) (AGCA1) (DUVALL) (AGCA2) (MARGETT) (BES2) (SACBES) (BIA-SD2) (TA) (MCQUEEN3) (SCCA3) (ARTBA2) (ACPA)

2. **Comment:** The CIAQC/CBCC proposal would be easier to comply with and more flexible. (ABBS2) (AGCA1) (MCQUEEN3)

Agency Response: While staff acknowledges that the CIAQC/CBCC proposal would achieve emission reductions relative to the baseline inventory, staff assessed this alternative proposal and rejected it for the following reasons:

- It would not achieve emission reductions comparable to the ARB regulation;
- It would result in more premature deaths and illness;
- It does not meet 2014 Statewide Implementation Plan (SIP) need for NOx reductions necessary to achieve the PM2.5 AAQS;
- It would not be as fair to the various fleets, and;
- In some cases, it would give affected fleets less flexibility.

The CIAQC/CBCC alternative would not require fleets to take any action until 2015, thereby providing no certainty of any emission reductions before then. Thus, the CIAQC/CBCC alternative would likely forego substantial emission and health benefits before 2015, and would fail to achieve the emission reductions necessary to bring several California air basins in to attainment with federally mandated ambient air quality standards by 2014.

As discussed in the Staff Report and TSD, the regulation, as adopted, is expected to prevent 4,000 premature deaths over the course of its implementation, including 1,205 deaths before 2015. If the CIAQC/CBCC proposal were adopted, there is a very high likelihood that these deaths may not be avoided.

As described in Chapter II of the Staff Report, and Chapter IV of the Technical Support Document, non-attainment areas of the state are required to develop SIPs describing how they would attain federally mandated PM and NOx standards by certain deadlines. Because the PM2.5 standard is an annual average, U.S. EPA requires that all necessary emission reductions be achieved one calendar year sooner, or by 2014. While all sources of NOx, which is a precursor of PM2.5, and PM emissions are important, off-road diesel vehicles are one of four major categories that will determine whether California is able to meet the 2014 deadline for PM2.5 attainment in the South Coast Air Basin. In the SCAQMD, the PM2.5 SIP commitment for total NOx reductions is 194 tons per day in 2014.

If the SIP targets are not met, California could lose billions of dollars of federal highway funding. This would negatively impact the California economy and especially the construction industry. Also, if the SIP commitments for in-use off-road vehicles are not met, the state is legally obligated to achieve (make up) a similar amount of emission reductions from other sources. To date, ARB is not able to identify where additional emission reductions could be achieved to substitute for these emission reductions.

Table III-A-8)-1 below shows the statewide fleet average (g/bhp-hr) for NOx and PM for large fleets for both the ARB rule and the CIAQC/CBCC alternative and

compared those fleet averages against the declining statewide fleet average baseline.

As can be seen in Table III-A-8)-1, Figure III-A-8)-2, and Figure III-A-8)-3 the reductions in statewide fleet targets, and by extension the emissions, from the CIAQC/CBCC alternative are far less than from the ARB proposal. (Emission targets must be weighted by the total horsepower in the various horsepower categories to yield a statewide fleet target, also, emissions targets are used as surrogates for emissions reductions.) As can be seen in Figure III-A-8)-2, the CIAQC/CBCC alternative for NOx is equivalent to doing nothing beyond normal turnover for many years.

Also, whereas the ARB rule sets annual targets, the CIAQC/CBCC targets are mandated in five year intervals; and, fleet owners would likely do less in the intervening years under the CIAQC/CBCC alternative. Thus, it is likely that the loss of emission benefits from the CIAQC proposal would be greater than is indicated by the numbers in Table III-A-8-1. Adopting the CIAQC/CBCC alternative would lose significant emissions benefits and result in fewer lives saved from diesel exhaust emissions.

Table III-A-8)-1 Percent Reductions from Baseline Statewide Fleet Average Emission Rates (g/bhp-hr)

	Percent NOx Reductions From Baseline			Percent PM Reductions From Baseline	
	ARB	CIAQC		ARB	CIAQC
2015	7%	7%	2015	46%	21%
2020	27%	0%	2020	73%	26%
2025	0%	0%	2025	53%	31%

Figure III-A-8)-2

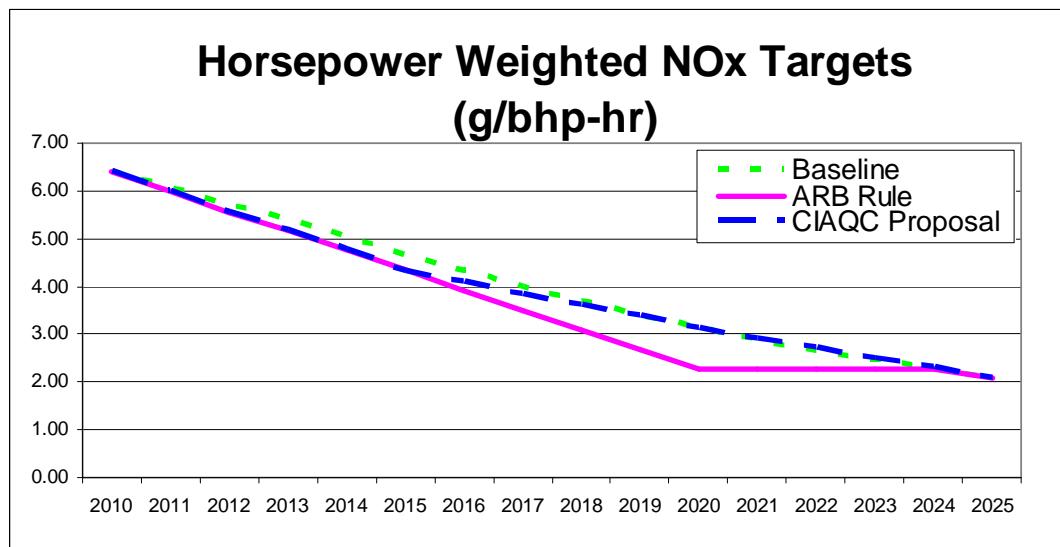
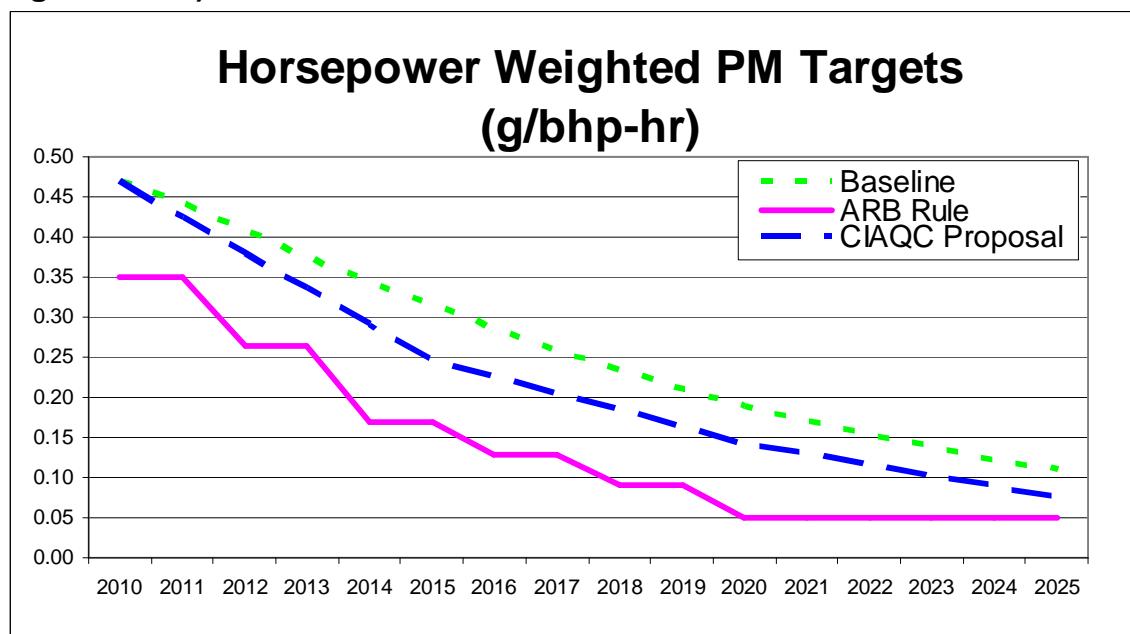


Figure III-8-A)-3



In evaluating the CIAQC/CBCC alternative, we have concluded that while it may appear to be equitable to the various fleets by requiring a fixed percent reduction in emissions for each fleet, it would, in fact, impose a greater burden on newer, cleaner fleets and less of a burden on older, dirtier fleets relative to the regulation. This is because the owner of a dirtier fleet would be able to purchase older, used vehicles that meet a less stringent emission standard to achieve his prescribed percent reduction in emissions for less money than the owner of a newer fleet that would need to buy newer vehicles at greater cost to achieve the same percent reduction of emissions from their individual baseline; or,

alternately, the older fleet could buy fewer new vehicles to meet their target than the newer fleet.

For example, in 2010, assume a fleet of one hundred 2002 and older 150 horsepower vehicles has a NOx fleet average of 6.9 g/bph-hr whereas a fleet of 100 hundred 2007 and newer 150 horsepower vehicles has a NOx fleet average of 2.6 g/bhp-hr. Under the CIAQC proposal, in 2015, to meet a 32.5 percent NOx reduction, the older and newer fleet would have to replace 34 and 37 of its vehicles respectively with new vehicles to meet their respective standard. The newer fleet has to do almost 10 percent more turnover than the older, dirtier fleet.

This means that the CIAQC/CBCC alternative would, in effect, penalize the more proactive fleet owners and would maintain a wide range of exhaust emissions rates between clean and dirty fleets. On the other hand, the ARB proposal reduces the range exhaust emissions rates between the dirtiest and the cleanest fleets as all California fleets are cleaned up over the life of the rule and rewards fleets that have taken early action to clean up.

Also, the CIAQC/CBCC alternative would not be fair to fleets with certain horsepower engines. Since the emission standards (between engine Tiers) of the 25-74 horsepower engines and engines greater than 750 horsepower vary far less than other horsepower range engines, it could become impossible for some fleets to achieve the required NOx reductions without installing selective catalytic reduction retrofits, which would not be required under the regulation..

For example, the emission factors for 50 to 74 horsepower engines do not change from year 2008 forward; thus the owner of a fleet consisting largely of engines in this horsepower range would not be able to achieve the prescribed percent reduction in NOx emissions in the CIAQC/CBCC proposal through the purchase of newer vehicles, and could only meet these targets by retrofitting vehicles with SCR devices. Assuming these devices are available for this horsepower range, this would likely be a significant new cost not likely imposed on owners of other size engines by the regulation.

The CIAQC/CBCC alternative states “it provides each contractor with the flexibility to use the full range of options available such as repowering, retrofitting, replacing or retiring equipment as they see fit.” However, these same options are available under the regulation and, in that sense; the CIAQC/CBCC alternative is no more flexible, and in fact, as demonstrated above, is in some cases more prescriptive and stringent than the regulation.

On balance, while the regulation has less flexibility than the CIAQC/CBCC proposal in that it requires compliance with the fleet average targets annually, rather than at five year intervals, the regulation does provide additional flexibility by allowing fleets to choose the BACT path that would be best for their operations (the CIAQC/CBCC alternative does not provide a BACT path). Staff

believes that providing multiple compliance options provides the greatest number of avenues for compliance, allowing each fleet to evaluate their unique situation and lay out the best course of action towards compliance. In addition, as described above, five year intervals are not as effective in achieving the needed emission reductions and health benefits since some fleet owners would likely delay action longer than with annual targets.

Overall, staff believes the ARB rule is more cost-effective, equitable, and beneficial to affected fleet operators than the CIAQC proposal, and provides greater emission and health benefits.

The complexity of the regulation is addressed in the response to comment III-A-5)a) of this FSOR.

Staff's rationale for the fleet size definitions used in the regulation is provided in the response to comment III-A-6)b)iv) of this FSOR.

8)d)ii) ATA Proposal

1. **Comment:** ARB can devise any number of alternatives that achieve the same goals without the vagaries and extreme uncertainty of the current proposal. (POHLE)
2. **Comment:** The rule is unnecessarily complex and unpredictable and will not allow our members to know the rule's requirements reasonably in advance of each year's March 1 compliance deadline. (POHLE)

Agency Response: As documented in the Staff Report and Chapter X of Technical Support Document, we believe the regulation provides the most cost-effective means to maximize emission reductions from off-road vehicles. This is done in a way that is protective of public health while taking into consideration the cost imposed upon the regulated entities.

Staff disagrees with the commenter that the regulation is vague. The regulation clearly defines the requirements for any given fleet at a given point in time. While these requirements may change as a fleet owner changes the composition of their fleet (adding, deleting, or modifying fleet vehicles), the fleet owner can, at the same time, consider how these choices will affect what needs to be done to comply with the regulation's requirements. The requirements do not shift; it's the composition of the fleet that changes, and how those changes occur is a decision that is entirely under the control of the fleet owner.

The responses in Chapter III-A-5 of this FSOR describe further why staff believes the regulation is clear, even though it is complex.

In its comments, the Air Transport Association (ATA) made an alternative proposal. The reasons we believe the regulation is superior to that proposal are described below in the response to the next comment.

- 3. Comment:** Air Transport Association (ATA) recommends that ARB adopt the proposal below:

Section 2449(d)(1)(E) Fixed Target Compliance Option —

As an alternative to the compliance dates and NOx and diesel PM targets in section 2449(d)(1)(A), owners of large and medium fleets may opt instead to comply with this regulation by calculating fleet average NOx and Diesel PM Fixed Targets for two compliance dates, March 1, 2014 and March 1, 2020, and developing and making available to ARB compliance plans for achieving those Fixed Targets, as set forth in this Section 2449(d)(1)(E).

Calculating 2014 and 2020 Fixed Targets

The 2014 Fixed Fleet Average Emission Target Rates (“2014 Fixed Targets”) and 2020 Fixed Fleet Average Emission Target Rates (“2020 Fixed Targets”) for NOx and diesel PM shall be determined for each fleet using the NOx and diesel PM Target Rate formulas under Section 2449(d)(1)(A) (and the other provisions of this regulation relevant to the calculation of Target Rates under Section 2449(d)(1)(A), including Sections 2449(d)(i)(C) and 2449(e)). However, notwithstanding the foregoing:

- a. the 2014 Fixed Targets shall be calculated using the NOx and diesel PM targets for the 2014 compliance date as set forth in Tables 1 and 2 under Section 2449(d)(1)(A), applied to each engine that was part of the fleet as of January 1, 2010; and
- b. the 2020 Fixed Targets shall be calculated using the NOx and diesel PM targets for the 2020 compliance date as set forth in Tables 1 and 2 under Section 2449(d)(1)(A), applied to each engine that was part of the fleet as of January 1, 2016.

1. Development and Maintenance of 2014 and 2020 Compliance Plans

By April 1, 2010, each fleet owner shall calculate its 2014 Fixed Targets and develop a 2014 Compliance Plan, setting forth the fleet’s 2014 Fixed Targets and the changes the fleet expects to make to achieve the 2014 Fixed Targets.

By April 1, 2015, each fleet owner shall calculate its 2020 Fixed Targets and develop a 2020 Compliance Plan, setting forth the fleet’s 2020 Fixed Targets and the changes the fleet expects to make to achieve the 2020 Fixed Targets.

The fleet owner may include in the 2014 and 2020 Compliance Plans any combination of changes to the fleet to achieve the 2014 and 2020 Fixed Targets (e.g., purchases of electric, replacements with gasoline-powered vehicles, VDECS, purchases of higher Tier diesel vehicles or engines, etc.). The 2014 and 2020 Compliance Plans shall be prepared using forms to be provided by ARB, or in a substantially similar format.

Compliance Plans may be updated periodically at the fleet owner's option to eliminate obsolete provisions, reflect availability of new technologies or new company operating and capital plans, or other changes. A copy of the 2014 and 2020 Compliance Plans shall be maintained at a location within the State of California, and shall be made available or submitted to ARS upon request.

2. Achievement of 2014 and 2020 Fixed Targets

In lieu of the Annual Reporting and Compliance Certification provisions of Section 2449(g)(1)(D)(2), the fleet owner shall report to ARS: (a) by April 1, 2014, its NOx Index and diesel PM index as of March 1, 2014; and (b) by April 1, 2020, its NOx Index and diesel PM Index as of March 1, 2020. The NOx and diesel PM Indexes shall be calculated as provided under Section 2449(d)(1)(A) or (D) (Hours in Fleet Average Option), and the other provisions of this regulation relevant to the calculation of NOx and diesel PM Indexes under Section 2449(d)(1)(A) or (D) (including Sections 2449(d)(1)(C) and 2449(e)). Achievement of the 2014 and 2020 Fixed Targets shall constitute compliance with this regulation, notwithstanding whether the measures actually implemented differ from those identified in the 2014 and 2020 Compliance Plans.

If the fleet's NOx Index and/or diesel PM Index exceeds the 2014 Fixed Target for that pollutant by 10 percent or less, the fleet shall have until August 1, 2014 to address the shortfall and demonstrate achievement of the 2014 Fixed Target for that pollutant. Similarly, if the fleet's NOx Index and/or diesel PM Index exceeds the 2020 Fixed Target for that pollutant by 10 percent or less, the fleet shall have until August 1, 2020 to address the shortfall and demonstrate achievement of the 2020 Fixed Target for that pollutant. (ATA1) (POHLE)

Agency Response: The ATA objects to the regulation's "complexity and unpredictability". In its comments, presumably to correct these objections, ATA recommends adopting their proposal. The ATA proposal suggests establishing two fleet average emissions target dates of 2014 and 2020. It further states, "In 2010, each fleet would calculate a 'fixed' 2014 fleet average emission target based on the fleet's 2010 horsepower mix. The target would be set to require the same level of emission reductions by 2014 as under the current proposed

regulation. This would give the fleets four years to achieve a known level of emissions reductions..."

ARB staff has evaluated this proposal, and we disagree with the commenters' findings. Based on our analysis, the ATA proposal would 1) result in a significant loss in emission benefits compared to the regulation, especially in the years before 2014, 2) create inequity among fleets whose horsepower distribution changes over time, and 3) require ARB to potentially evaluate and critique thousands of compliance plans.

Staff notes that the ATA comments and proposal are vague in that they do not specifically indicate whether provisions other than fleet average requirements within the regulation, such as the alternative BACT provisions, support ATA's position that the regulation is too complex and unpredictable. We assume for purposes of this discussion that the commenters believe that the BACT provisions are also too complex and unpredictable. Again, we disagree with this conclusion. By their very nature, the BACT provisions are prescriptive and for that very reason, they provide predictability and a means for fleets to comply with the regulation if a fleet cannot (or chooses not to) meet the fleet average requirements that they believe, as written, are too complex and unpredictable.

The ATA Proposal Results in a Loss in Emission Benefits

The ATA proposal, similar to other proposals that lack annual targets (i.e., multi-year targets) would likely provide less emission benefits in the years without targets than the regulation. Just as individuals often wait until the last possible moment to file their taxes (and even file for extensions), staff expects that many affected fleets would also wait until the last possible moment to comply with the regulation as a means to avoid spending money in years that do not have mandatory compliance targets. While it is not possible to quantify with certainty the extent of delay in compliance due to extended multi-year targets, it is not unreasonable to expect that fleet owners would attempt to gain the maximum possible economic advantage to delay compliance to very last possible moment. Following this thinking, should none of the new vehicles or VDECS be delivered until the final compliance dates, there would be a 100 percent loss of emission reductions for the years 2010 through 2014.

Because some of the health benefits that are realized by the regulation, such as mortality, are cumulative in nature, and given the large emission reductions that will be achieved by the regulation, as adopted, in the years from 2010 through 2013, and the likely loss of significant benefits associated with a multi-year target, the ATA proposal would lead to an unacceptable increase in premature deaths and illness. The regulation, as adopted, is expected to prevent 4,000 over the course of its implementation, including 888 deaths before 2014. It is not possible to say with certainty how this number would be reduced under the ATA proposal, but similar to staff's analysis of the CIAQC/CBBC proposal, the impact

could result in perhaps as much as 25% fewer lives being saved. Staff believes that this potential increase in premature deaths and illness is not acceptable from a public health standpoint.

We also do not believe the ATA proposal could actually guarantee the same reductions in the year 2014 as the regulation. ATA states, "The target would be set to require the same level of emission reductions by 2014 as under the current proposed Regulation." To achieve the same level of reductions just in 2014 (ignoring achieving comparable emission reductions in prior years, which is discussed above) the fleet owner would need to know ahead of time the composition of the fleet in 2014 since that would determine the emission reductions achieved under the regulation.

To comply with the regulation, since targets are set on an annual basis, a fleet need only project fleet composition one year in advance. In order to guarantee equivalent emission reductions to the regulation, however, under the ATA proposal, a fleet owner would need to project fleet composition four years in advance to determine a compliance path that would achieve comparable emission reductions. This would be far more difficult to do with any certainty.

For example, under the ATA proposal it would appear that a fleet owner would have to anticipate their fleet composition in 2014. To do so, perhaps as early as 2009, a fleet owner would have to plan vehicle purchases from 2010 to 2014, as shown in Table III-A-8)-4.

Table III-A-8)-4

Year	Vehicles Added to Fleet Planned		
	in 2009	Actual	Discrepancy
2010	1	3	2
2011	2	5	3
2012	3	6	3
2013	4	7	3
2014	5	8	3
	15	29	14

In this example, in 2009, the fleet owner plans to add one vehicle in 2010, two in 2011, and so on. However, they actually end up adding three vehicles in 2010, creating a discrepancy of two vehicles in that year. Under the regulation, the fleet owner would determine compliance for those two additional vehicles as they are contemplating purchasing those vehicles and take actions to comply in the same year. Similarly, in future years under the regulation, the fleet owner would determine compliance as an integral part of the fleet plans to purchase, retire, or take other action on a vehicle.

It is unclear what ATA would anticipate the fleet owner to do under the ATA proposal. In 2010, would the fleet owner 1) take actions to comply, 2) determine there was a discrepancy but do nothing, or 3) not determine if there was a discrepancy? If the fleet owner takes actions to comply, then the fleet owner is doing the same as under the regulation and therefore there is no need for or advantage to the ATA proposal. If the fleet owner determines the discrepancy but does nothing then there would be a loss of emissions benefits plus a backlog of actions to be taken at a later date. If the fleet owner does not determine if there was a discrepancy, their actions would be similar to the fleet owner that does nothing. Will they wait until 2014 and then try to comply with a discrepancy of 14 vehicles? In any of these scenarios, the ATA proposal does not provide any greater certainty to the fleet owner than under the regulation. Instead, fleet owners would be faced with a likely backlog of actions that they must take at the last moment, creating a much more difficult (and costly in that year) compliance path.

Using the tax analogy, the ATA proposal does not appear to provide greater certainty - if a taxpayer procrastinated and had a backlog of five years of taxes would they have greater financial certainty than if they had paid taxes on an annual basis? We don't believe so.

The ATA Proposal Is Inequitable for Fleets with Shifting Horsepower

The ATA proposal would not be equitable among fleet owners because it fixes targets based on a fleet's initial horsepower distribution (ie, the number of engines that fall into the various horsepower "bins" in the regulation). Under the ATA proposal, a fleet that starts with vehicles of a given horsepower distribution will have a 2014 target based on that horsepower distribution. If a fleet shifts its horsepower distribution over time such that it contains more vehicles of horsepower ranges with later, less stringent new engine standards (for example, by owning more vehicles with engines over 750 hp and fewer with engines between 175 and 750 hp), it may find it impossible or very difficult to meet the fixed targets prescribed under the ATA proposal. Under the ATA proposal, because its 2014 targets would be set assuming the fleet had access to cleaner engines than they had in reality because of the shift in horsepower (to larger engines that can meet less stringent new engine standards), such a fleet would be at a disadvantage compared to a fleet whose horsepower distribution does not change over time or whose horsepower distribution shifts toward horsepower ranges with earlier, more stringent new engine standards. (Table V-3 of the Technical Support Document shows the new engine standards). Staff believes this creates inequities among fleets, and demonstrates why the regulation is a superior approach to the ATA proposal in providing a fleet average that is flexible and fair to fleets.

Further discussion of why we believe targets that shift with a fleet's horsepower distribution are preferable is in the response to comment III-A-6c)ii)1) of this FSOR.

Compliance Plans

Finally, the ATA proposal would require fleets to prepare compliance plans which would be available for ARB review. As described in the response to comment III-A-6k)vii)3) of this FSOR, staff does not believe ARB has the resources to evaluate and critique compliance plans from the nearly 10,000 fleets expected to be affected by the regulation. This, combined with the reasons enumerated above, leads staff to believe the regulation, adopted is superior to the ATA proposal. It ensures greater emission reductions while providing greater fairness, flexibility and predictability for fleet owners.

8)d)iii) South Coast District Alternative

- 1. Comment:** The South Coast Air Quality Management District (SCAQMD) proposes an addition to the off-road regulation in order to achieve additional emission reductions. We believe there are ways to accelerate the turnover of these 30 year old Tier 0 and Tier 1 engines. Tier 3 engines are already available so opportunities exist today to modernize the existing Tier 0 and 1 vehicles with Tier 3 engines. Also, NOx after-treatment devices are rapidly becoming available, offering lower compliance costs compared to vehicle or engine replacement.

The proposal focuses only on large fleets (defined as 5,000 hp or greater at the time of the proposal) that have over 40 percent Tier 0 and Tier 1 vehicles. Because of their economies of scale, greater resources and revenue streams and greater access for financing, large fleets are more likely to be able to absorb or pass on the compliance costs without significant impact on their profitability. We propose increased annual BACT turnover rate to 15 percent from 2010 to 2014, and more stringent NOx targets for these large fleets.

We estimate the proposal would impose an additional \$400 million cost to South Coast fleet owners over the next 16 years. We project that the amendment would affect 80 to 90 percent of the total horsepower used in off-road diesel, and result in a reduction up to 13 tons per day of NOx emissions in 2014 and 7.6 tons per day in 2020 in the South Coast Air District alone, without lowering PM reduction benefits. (SCAQMD1) (SCAQMD2) (SCAQMD4)

- 2. Comment:** We suggest a special provision be included for those large fleets affected by the AQMD staff proposal that demonstrate a financial hardship and cannot access financial assistance to comply with the AQMD staff proposal to instead comply with the CARB staff proposed regulation.

The Staff Report indicated that “a 10 percent decline in “return on owner’s equity” has traditionally been used by ARB. We believe that this criterion could be a starting point for discussion concerning an economic hardship provision. (SCAQMD1)

Agency Response: We recognize the need for additional emission reductions in the South Coast and San Joaquin Valley air basins, but we do not agree that large fleets can easily bear any additional cost. As noted in the Initial Statement of Reason, staff believes the proposed statewide off-road regulation represents the economic limit of what industry could bear, and any further emissions reduction requirements would likely require financial incentives. Please see the response in section III-A-6k)vii)(9) of this FSOR for a discussion of why we do not believe it is feasible to build economic hardship provisions into the regulation, as suggested in the SCAQMD1 comment.

Based on this reasoning, the staff did not believe the commenter’s proposal was economically viable as it did not ensure that affected industry was compensated for costs beyond those incurred by compliance with the statewide off-road regulation.

SCAQMD revised its proposal and resubmitted it as the Surplus Off-Road Opt-in for NOx (SOON) program, which the board later adopted as part of the off-road regulation. The SOON program is discussed in chapter 9 of this document and is detailed in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008.

8)d)iv) Simpler Alternative

- 1. Comment:** Rather than requiring medium and large fleet operators to go through the labor intensive rigmarole of annual fleet average requirements, BACT, and so forth, when there really is little flexibility, simply require that 20% of Tier 0, 1, 2, or 3 engines be retrofitted (where feasible) with the highest certified device (must be Level 2 or 3), by 2010, 50% by 2015 and 100% by 2020. Operators would have to start with Tier 0s, then 1s, and then Tier 2/3s. Any Tier 0 or 1 engines where Level 3 devices are still infeasible by 2020 would have to be retired. For small fleets I would propose the same basic approach with extended compliance deadlines (CBIA)
- 2. Comment:** CARB could have created a much simpler rule; for example, each fleet could calculate and submit its 2000 fleet average, then reduce its PM and NOx by a certain percentage by 2015 and 2020. (TA)
- 3. Comment:** Given the complexities and uncertainties, compliance with the regulation should be prospective. Operators should be allowed to develop detailed compliance plans, which will define the changes that must be

made to their existing fleet over a 5-year period (2010-2014). Any shortfalls from the 2015 target must be made up by 2016, and the final fleet averages, as currently proposed, will be achieved by 2020. Operators would be allowed to modify their plans to incorporate new, improved and verified technologies that will develop and mature through the implementation of the regulation. This approach will allow for the planning certainty required by ARB and the local air districts, and provide operators with much needed flexibility and planning certainty. (CSIA)

Agency Response: Staff did not propose multi-year compliance targets for a number of reasons. First, as discussed in greater detail in the responses earlier in Chapter III-A-8 of this FSOR, establishing emission reduction targets every five years or other multi-year increments in place of annual targets would likely result in the loss of emission benefits. The longer the multi-year increment, the greater the likely loss of emission benefits due to delayed compliance. Staff believes that fleet owners would likely delay as long as possible any action to clean their fleet beyond normal vehicle turnover. The result of this is that, to the extent that a fleet owner delays compliance, the fleet owner will have that much more difficulty complying with the regulation since a number of compliance actions will have been deferred to the final year of a multi-year target period.

Also, staff believes that predicting fleet composition five years out would be much more difficult than predicting fleet composition on an annual basis. Therefore, compliance planning is expected to be easier on an annual basis and will lessen the likelihood that fleet owners will have to confront the need for overwhelming fleet changes during a particular period.

In addition, the Board did not adopt a retrofit-only proposal like the one in the first comment above because only requiring retrofits would not achieve any NOx reductions.

Finally, the Board did not adopt a regulation that sets fleet average targets based on each fleet's initial fleet average because that would tend to penalize fleets that start out with a cleaner fleet. For example, a fleet that began complying with the regulation having 100 percent Tier 0 vehicles would end up dirtier than one that started out with 100 percent Tier 1 vehicles, even though both fleets may have achieved the same percent reduction in their emissions. In addition, basing the fleet targets on a fleet's year 2000 fleet averages would require that all fleets have adequate records to document their year 2000 fleet composition. Staff believes it is unlikely that all fleets have these records available.

Please see the response in Chapter III-A-6(k)(vii)3) of this FSOR for a discussion of why the adopted regulation does not allow submission of alternate compliance plans.

4. Comment: Please consider other options. (BING) (HAYWARD1)

5. **Comment:** The state must stop this regulation, and work with the equipment and construction industries to find a more reasonable, phased alternative. The new alternative should be gradual in implementation and contain proper notification to all that it will affect. (DEFOREST)
6. **Comment:** It seems to us that there must be a better solution that phases in changes in a much more realistic form. (BECKER)

Agency Response: Over the three years during which the rule was developed, staff considered many possible regulatory structures and elements. Staff incorporated many recommendations from stakeholders, including allowing fleet averaging, giving double credit for electric vehicles in some years, raising the annual hour threshold for low-use vehicles, including more horsepower groups in the calculation of the fleet average, and providing credit for early actions. Staff met often with industry and other stakeholders in workshops, meetings, and conference calls over the three years of rule development, and attempted to contact over 300,000 individuals to notify them of the pending rule.

Staff did not accept all the suggestions received from stakeholders because in developing the regulation, staff was striving to achieve the following goals:
Achieve the maximum, fastest possible, reduction in diesel PM emissions;
At the same time, maximize the NOx reductions achieved by 2015 to aid in attainment of the PM2.5 standards in the South Coast and San Joaquin Valley Air Basins;
Minimize the cost for fleets and, in particular, minimize the need for fleets to control equipment twice (for example, by having to turn a vehicle over twice during the course of the regulation);
Achieve cost-effective emission reductions on a dollar per ton basis; and
Fully utilize technology available today and take advantage of technology that is likely to become available over the next decade.

The alternatives considered and reasons they were rejected in favor of the chosen NOx and PM fleet average approach are summarized in the Chapter XI of the Staff Report and Chapter X of the Technical Support Document.

Please see the response in Chapter III-A-16(g) of this FSOR for a further discussion of how staff responded to stakeholder input during development of the regulation.

7. **Comment:** ARB should support an alternative regulation implementing AB 712. AB 712 would resolve the problem addressed by the regulation by requiring operators of solid waste landfills to pay a state mandated fee of 50 cents per ton on solid waste disposal during the period April 1, 2009 until January 1, 2016. These funds would be used exclusively to reduce

harmful diesel emissions from off-road vehicles operating at solid waste facilities and to produce clean waste-derived transportation fuels.

Specifically, AB 712 would:

Accelerate reductions in off-road diesel emissions by at least five years and encourage operators to evaluate the use of alternative fuel technologies that will also help reduce greenhouse gas emissions; and Provide \$4 million per year in new grant funds that will promote projects that demonstrate the commercial viability of producing clean transportation fuels from municipal solid waste and recovered landfill gas. (STODDARD)

Agency Response: ARB does not take positions on pending legislation. As with all proposed legislation, it is difficult, if not impossible, to know whether this legislation will be passed by the Legislature and signed by the Governor, and what provisions will be included in the final bill. Also, because AB 712 is not law, ARB does not have the authority to implement its provisions, and staff does not believe pending legislation should delay the adoption of the rule. As discussed in Chapter II of the Staff Report and Chapter IV of the Technical Support Document, there is need for emission reductions as soon as possible.

8)e) Biodiesel Alternatives

1. **Comment:** Don't penalize the small businesses which are already exceeding AB 32 initiatives utilizing bio-diesel fuel. I have 2 Tier 0 Diesel Chippers and 1 Tier 2 Bobcat Tractor. I am currently running Bio-diesel (20%) eventually working to 90% Bio-Diesel and 10% regular red diesel. I know if I run this mix I will beat your Tier 3 emissions requirement. ARB should allow small business to use bio-diesel to satisfy the regulation requirements. ARB should allow small business to meet replacement targets by running 50% BIO-Diesel and 50% ULS Diesel. (BTS1) (BTS2)

Agency Response: The regulation only requires small fleets (those with less than 2,500 hp) to meet the diesel PM targets, not the NOx targets. Also, small businesses are not currently required to meet any greenhouse gas emissions targets. Based on the commentor's comment that they have two chippers - which are most likely portable and therefore not subject to the regulation - and one Bobcat tractor, the commenter would definitely fall under this 2,500 hp threshold.

Actions on the part of small fleets that alter the emissions of NOx or greenhouse gases are not required in this regulation. On the other hand, to meet the requirements that small fleets take actions to reduce their PM emissions, a fleet owner may either use engines certified to a cleaner standard or use any technology that has been verified by ARB as a VDECS.

Biodiesel by itself is not currently verified as a retrofit technology. In fact, there is some concern that biodiesel use may actually increase NOx emissions. Also, it

is not likely that biodiesel, especially 20 percent biodiesel blends (B20), will meet the Level 2 verification level (50 percent reduction in diesel PM), which is the minimum level a verified device must meet to be used in the regulation .. However, biodiesel makers may apply for verification just like any other diesel control strategy. If biodiesel becomes verified, and is verified as at least a Level 2 control strategy, then emission reductions achieved with biodiesel would count just like any other verified control strategy.

Staff expects that fleets will still be able to continue to use B20 and comply with the regulation. Please see the response in Chapter 8 of this FSOR for a discussion of the use of B20 with the retrofit devices required by the regulation.

2. **Comment:** ARB did not factor in bio-diesel and therefore did not adequately estimate PM emissions. Using biodiesel in various blends, i.e., B2, B5, B20 and B100 should be inculcated into ARB's projected assessments regarding compliance with new regulatory mandates as to mitigation of risks to human health, i.e., PM 2.5 and larger-sized particulates. (SCB)

Agency Response: See response to previous comment. While there are PM emissions reductions associated with the use of biodiesel, currently, less than four percent of all California on-road and off-road diesel vehicles use bio-diesel, and therefore staff expects that overall the current use of biodiesel has a negligible impact on the State's PM emissions' inventory. Staff is also unable to predict how the use of biodiesel may change in the future. However, to the extent that biodiesel as a verified diesel emission control strategy is used, those diesel PM emission reductions have been accounted for in staff's emission benefit calculations.

3. **Comment:** ARB should mandate the use of bio-diesel for all construction equipment. (SCB)

Agency Response: To provide maximum flexibility to affected fleets, the regulation was designed to be technology neutral; i.e., the regulation will not promote a specific technology over another, but instead sets performance criteria which fleet owners must meet. Fleet owners have the freedom to choose any technology which meet ARB's criteria and may take credit for Level 2 or Level 3 VDECS in their fleet average calculations. Should biodiesel be verified as a Level 2 or Level 3 diesel PM emission control strategy under ARB's verification procedures, fleet owners could then claim credit for biodiesel under the regulation just like any other verified control strategy.

4. **Comment:** While we understand and appreciate the ongoing efforts of CARB to acknowledge B20, by non-regulatory policy, as a CARB sanctioned diesel fuel, we are concerned that there are very limited certified retrofit devices that have been verified with B20 and there is not

any indication that this is likely to change in the near future. Given the non-regulatory status of CARB's biodiesel policy, in combination with the fact that very few of the potentially available diesel emission control systems have been verified with B20, we remain concerned about potential engine warranty difficulties post-retrofit. (USN)

5. **Comment:** Why doesn't CARB let us run our older equipment with a verified device and Bio-fuel, we could make a greater impact on air quality without destroying business and the economy. (CER)

Agency Response: It is not true that there are very limited certified retrofit devices that have been verified with B20. All of the diesel emission control strategies currently verified for off-road use are verified as compatible with up to B20. These include the devices from the following manufacturers: Caterpillar, Cleaire, Huss, DCL, and ECS.

For devices that are verified in the future for off-road use, all that is needed for a device to be verified for use with B20 is a statement from the device manufacturer saying that the device is compatible with biodiesel, and that they will warrant their device when used with up to B20.

6. **Comment:** I suggest you might focus more immediately on requiring a cleaner refining of diesel fuel. This could be done as an interim step to what you are currently proposing and produce immediate measurable improvement in our air quality. Next requiring new equipment to be made as soon as reasonably possible, to meet your standards would be warranted. Third, encourage retrofitting technology to enable older equipment to burn cleaner, and still operate would greatly lessen opposition to your proposals. (WP)

Agency Response: ARB has mandated cleaner diesel fuels starting in 1988 and most recently updated the cleaner diesel fuel regulation in 2004, which required all diesel fuel sold in the state to meet a 15 parts per million sulfur standard. In 2005, ARB also adopted regulations requiring engine manufacturers to meet new Tier 4 engine standards for off-road engines which for most horsepower groups will be available in the 2011 to 2015 timeframe. The current rule encourages retrofitting diesel engines as a means of cleaning older diesel equipment. Under the regulation, fleet owners may comply with the PM performance requirements by retrofitting their vehicles with the highest level VDECS available; if they do, the vehicles would get a six-year guaranteed life under which they are exempt from having to meet the NOx turnover requirement.

Please see the response in Chapter III-A-6(a)i) of this FSOR regarding why it is necessary to regulate end-users of vehicles and not just manufacturers.

Please see the response in Chapter III-A-2)a)i) of this FSOR for a discussion of how ARB is encouraging the development of retrofit technology.

7. **Comment:** Adopt the proposal for mobile cranes submitted by Sierra Research. This proposal would recognize the unique issues related to mobile cranes – including the issue of having to bring our equipment into compliance with multiple regulatory requirements. It is really important that you consider the uniqueness of the crane and take that into consideration. (VLAMING) (HAMMOND)

Agency Response: Staff has reviewed the crane proposal and recognizes the unique issues faced by crane owners; unfortunately, staff did not have time to incorporate the proposal into the rule. Staff will continue to work with the crane industry and intends to address the issues raised in the proposal in future regulations, such as the pending Statewide Truck and Bus Rule, currently scheduled to be considered by Board in October, 2008.

8)f) Other Program Suggested

1. **Comment:** ARB should work with industry, the construction funding agencies, and the Legislature to explore the availability of using incentive programs to reduce emissions from construction projects and to accelerate the turnover of construction fleets. (PILCONIS) (AGCA3)

Agency Response: The ARB would need additional legislative authority to implement a funding program that goes beyond the existing Carl Moyer Program. ARB will be responsive to future legislative mandates; however, significant emissions benefits would be lost if this regulation were to be delayed in anticipation of potential legislation.

See also the response in section III-A-6)e) of this FSOR for a further discussion of incentive programs.

2. **Comment:** ARB should consider working with industry, California air districts, and the funding agencies to develop models for using retrofits, new equipment, and site-specific mitigation techniques to reduce the impact of construction projects. (PILCONIS) (AGCA3)

Agency Response: ARB staff will be holding workshops, providing instructional materials, and meeting with individual fleets during the implementation of the rule. During these meetings, site-specific mitigation techniques may be discussed.

However, project-specific and pilot mitigation projects would not be a cost-effective means of reducing emissions on a statewide basis in lieu of the rule. The staff required to enforce site-specific mitigation and the stringent criteria necessary to make these measures enforceable would make an emission reductions program that relied on such measures impractical.

Lastly, ARB, SCAQMD, and the Mobile Source Air Pollution Reduction Review Committee are currently in the midst of a \$5 million off-road retrofit showcase demonstration project. This demonstration project is expected to spur the verification of many new off-road retrofit devices and is described in further detail in Chapter III-A-2 of this FSOR.

3. **Comment:** ARB should consider proposing and supporting single-pollutant alternatives because the legal and policy arguments for the two rules do not overlap completely. For example, if a court or EPA decided that the Clean Air Act preempts ARB's PM requirement, it would not be clear whether the NOx-only component could survive when severed from the PM component. If ARB considers the two halves of its rule as stand-alone rules, that may provide useful data on the relative merits of each portion of the rule. (PILCONIS) (AGCA3)

Agency Response: In the first Notice of Public Availability of Modified Text and Availability of Additional Documents, we bifurcated the NOx and diesel PM requirements of the regulation into section 2449.1 for NOx and section 2449.2 for diesel PM. Also, in the second Notice of Public Availability of Modified Text and Availability of Additional Documents, we added a severability clause in section 2449(m) to clarify that if one part of the regulation is found invalid, the remaining sections remain valid. That section now states, "If any subsection, paragraph, subparagraph, sentence, clause, phrase, or portion of section 2449, 2449.1, 2449.2, or 2449.3 of this regulation is, for any reason, held invalid, unconstitutional, or unenforceable by any court of competent jurisdiction, such portion shall be deemed as a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions of the regulation."

4. **Comment:** ARB should consider a proposal that would have limited geographic applicability to areas like the South Coast (Los Angeles) basin and San Joaquin Valley with especially intractable air-quality problems. (PILCONIS) (AGCA3)

Agency Response: Although the regulation, in general, applies statewide, there are provisions that provide maximum flexibility for local geographic areas. The rule currently has exemptions for captive-fleet vehicles in attainment areas and for public fleets that operate in low population counties. Also, at the Board's direction, we added the Surplus Off-road Opt-in for NOx (SOON) program specifically addresses the needs of local air basins. The SOON program is discussed further in the responses in Chapter III-A-9 of this FSOR. However, as stated, the general rule applies statewide, recognizing that the regulated vehicles are mobile and that geographic requirements have their limitations.

5. **Comment:** Insofar as ARB's cost-effectiveness justification for this rule applied only to public fleets, ARB should consider limiting the rule's precedents for public fleets' serving as incubators for new technologies and would address industry's concern that retrofit-package and new-vehicle manufacturers cannot meet demand if ARB's proposal applies to both public and private fleets. (AGCA3)

Agency Response: The cost-effectiveness calculation was based upon both public and private fleets being subject to the rule. Limiting the rule to just public fleets would forego significant emission reductions, thus leading to fewer premature deaths avoided and a failure to meet the State's SIP obligations. As stated in the Agency's response to comments in Chapter III-A-2 of this FSOR, ARB fully believes that sufficient supplies of VDECS and new engines and vehicles will be available for compliance.

8)g) Structure Regulation as a BACT Rule

1. **Comment:** Rather than requiring medium and large fleet operators go through the labor intensive rigmarole of annual fleet average requirements, BACT, and so forth, when there really is little flexibility, simply require that 20 percent of Tier 0, 1, 2 or 3 engines be retrofitted (where feasible) with the highest certified device (must be Level 2 or 3), by 2010, 50 percent by 2015 and 100 percent by 2020. Operators would have to start with Tier 0s, then 1s and then Tier 2/3s. Any Tier 0 or 1 engines where level 3 devices are still infeasible by 2020 would have to be retired. For small fleets I would propose the same basic approach with extended compliance deadlines.

For NOx control I would again jettison the annual emission compliance rates and targets. It is just too complex, and expensive and affords little real flexibility. In order to meet the 2020 NOx targets, a medium or large fleet would have to be comprised of almost entirely Tier 2/3/4 engines and Tier 2 engines would be a liability. I would start NOx control in 2015 and require that 50 percent of Tier 0 and 1 engines meet some level of "feasible" NOx control. Feasible would again be expressed on a cost/hp basis. To simplify the regulation I would probably have the regulation state that the cost/hp rate would be published by CARB in 2013, and updated bi-annually, via a coordinated process involving vendors and operators. By that date some form of cost-effective NOx retrofit technology should be available as a byproduct of Tier 4 engine technologies. By 2020 I would increase that to 100 percent of Tier 0 and 1 engines. By 2020, I would also require that 50 percent of Tier 2 engines meet that "feasible" control requirement. This would give operators more time to replace older equipment, and additional time for the development of lower cost technologies. I note that right now a 10 percent turnover requirement for a 20,000 hp fleet would cost roughly between \$400,000 to \$4,000,000 per

year depending on whether the equipment is repowered or replaced with new. (CBIA)

Agency Response: We believe the regulation contains significant flexibility for fleets. Fleets have the choice between meeting the fleet average targets and complying with the BACT provisions. Fleets have a choice between retrofitting, repowering, and replacing vehicles, and they may choose which vehicles to act upon first. Please see also the response in section III-A-6)k)ix) of this FSOR regarding the flexibility of the regulation.

We do not recommend adopting the provisions suggested by CBIA above in lieu of the regulation for the following reasons:

Having PM requirements that apply only every 5 years (in 2010, 2015, and 2020) would achieve far less diesel PM emission reductions than the regulation. This would mean many fewer premature deaths would be avoided. Like three-year targets, five-year targets would not guarantee progress in the years that have no targets. The rationale for having annual targets rather than targets every three years is described further in section III-A-6)c)ii)7) of this FSOR.

Mandating retrofits to meet the PM requirements would only remove flexibility that has been built into the regulation to allow fleets to choose a compliance pathway that accelerates turnover of vehicles rather than retrofitting engines. The CBIA proposal would not allow this.

Having NOx requirements that do not begin until 2015 would guarantee no NOx emission reductions in 2014, a key year for the South Coast SIP.

Basing NOx requirements on feasibility defined in terms of a cost/hp cap would share the same problems as including a cost cap in the regulation itself. Please see the response in section III-A-6k)vii)12) of this FSOR for a discussion of the reasons we did not propose a cost cap in the regulation.

Please see also the responses in Chapter III-A-3 of this FSOR for a discussion of why we believe we have adequately estimated the costs of the regulation and why we believe the regulation will be affordable for affected fleets.

8)h) Check Tailpipe Emissions Instead

1. Comment: I suggest the following approach:

- Check “tailpipe” emissions of registered equipment on a random basis. Shut down all machines above a reasonable threshold for its age and horsepower.
- Allow no new equipment into the state below Tier 2 or Tier 1 with factory installed Level 3 VDECS. (ECCO2)

Agency Response: We do not recommend adopting the approach suggested by the commenter in lieu of the off-road regulation because it is not practical and would not achieve the emission reduction goals of the regulation. Field testing of

tailpipe emissions is not feasible at this time, due to the equipment and facilities required to test engine emissions. Achieving reliable results from testing individual vehicle emissions would likely mandate bringing off-road vehicles to testing stations, similar to the SMOG program for automobiles, which we expect would not be practical or cost effective for most off-road fleets.

Even if this approach were possible, checking tailpipe emissions and removing vehicles with the highest emission levels would not provide sufficient emissions reductions. The only benefit of such a program would be to ensure that vehicles are emitting appropriately to the engine tier they were originally certified to meet. It would not ensure that turnover toward higher tier, cleaner engines is accelerated. For example, a Tier 0 engine could only be checked to be emitting at Tier 0 levels (which are not associated with specific emission standards). Due to the increasingly stringent new engine emission standards established by ARB and U.S. EPA, emissions from new off-road engines have been decreasing since the mid-1990s. Replacement, repowering, and retrofitting of the state's off-road fleets is necessary to achieve real, significant, and lasting emission reductions. The response in section III-A-6)a)i) of this FSOR describes further why relying on the new engine emission standards is not enough.

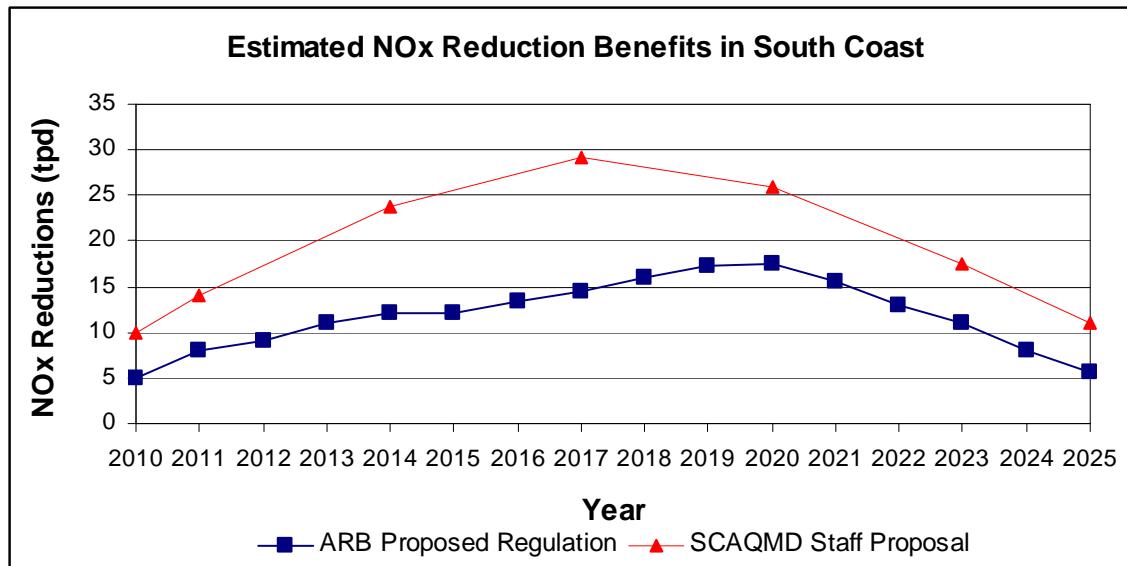
The commenter also suggests placing restrictions on the vehicles allowed to enter the state. The regulation requires that out-of-state fleets when operating in California comply with the same in-use performance requirements as fleets domiciled in California. If only new vehicles entering the state were required to meet the performance standards of the regulation (we presume the commenter is suggesting to exempt those vehicles that already reside in California), significantly fewer emission reductions would be realized, as the fleet of vehicles that were already in the state as of the implementation of this regulation would not get any cleaner.

9. SOON

9)a) Adopt the SOON Program

1. **Comment:** South Coast Air Quality Management District (SCAQMD) recommends CARB adopt their proposed amendment to the regulation. The proposal would allow air districts to require large fleets to submit a request for public funding for repowers or other actions that achieve a cost-effectiveness of \$5000/ton NOx reduction, or the fleets most cost-effective measure.

The following graph displays the emissions reduction benefits anticipated by SCAQMD if their proposal is adopted. (SCAQMD3)



2. **Comment:** We support the approach to establish a stringent baseline regulation applicable statewide and a limited scope specific enhancement to meet the local attainment needs in the regions worst air quality such as South Coast, and possibly other air districts. The proposed enhancements are intended to ensure the certainty and timing of the emissions reductions that are critical to the well being of our residents. (SCAQMD5)
3. **Comment:** We recommend your board adopt the enhanced provision to allow South Coast and San Joaquin to opt into these enhanced requirements. This is entirely consistent with the dual path fast track approach that our Bay Area Board has adopted and we think we can participate, both regulatory and financially in that program. We also ask that your Board also allow at least Bay Area Air Quality Management District to participate in this program. Given the fact that the district is in extreme non-attainment, and given the emissions from transport in the Bay Area, every ounce of emission reductions count, and we need to have that tool in our arsenal. (SJVAPCD3)
4. **Comment:** The SOON proposal for the San Joaquin Valley and beyond merits your support and represents a great opportunity for early implementers of this regulation. The Moyer rules specific to large fleets will run out of funding, from our experience, and that is why SOON will be very critical for businesses who want to implement early. Leveraging early dollars as a result of the SOON program will be very helpful. The Valley families and businesses that are part of our coalition feel that this is an important program, but it needs to be made achievable. And the number one achievement is not the technology filling in. I think that will happen over time with a technological off-ramp (as was successfully implemented

in the trash truck emission regulation), but the funding is the key element. (CFC)

5. Comment: On the whole you're going to see a much more significant reduction in emissions statewide as a consequence of the SOON program. We are insisting that the SOON program be statewide for all contractors because the big contractors, by their ability to access these funds and do this over compliance, are helping the small contractors who can't comply or can't qualify for Carl Moyer funds simply because in many cases they don't operate their equipment enough hours. We are in the process of working with the Legislature to get the SOON program without the limitations of Carl Moyer so that small contractors can qualify. We think SOON is going to allow them to start compliance much earlier than the dates that are established in your program. This was designed to help two districts who desperately need additional reductions in order to meet a very critical deadline for ozone, and we want to help them. If there's a way other districts feel they can work with local contractors and opt in, it may be beneficial. But it starts to change the complexion of the whole program if everybody in the state starts opting in to it. So I'm cautious about what impact that's going to have on the industry. (CBCC4)

Agency Response: The SCAQMD proposal was adopted during the July 25, 2007 Board Hearing. The Board directed staff to add the Surplus Off-Road Opt-in for NOx (SOON) program to the regulation for the purpose of using public funds to achieve additional emissions reductions beyond those that will be achieved by the in-use off-road diesel vehicle regulation. The SOON program allows any local air district in the state to opt-in to the program, and require that large fleets (20,000 HP or greater) that operate a majority of the time in the air district, and had a 40% or greater population of Tier 0 or Tier 1 vehicles in 2008, apply for funding from the air district.¹⁶ This funding will be used to take actions necessary to reduce NOx emissions further than required by the statewide off-road regulation, and will be used solely in the air district providing the incentive funding, with a focus on the most cost-effective projects. Fleets that do not meet the criteria listed above, but operate in the air district, may apply for funding as well but are not required to do so.

The SOON program is described fully in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008.

¹⁶ Before April 2, 2009, the program is voluntary for fleets. On or after April 2, 2009, the South Coast and San Joaquin Valley air districts can choose to make it mandatory for fleets. On or after April 2, 2010, other districts can choose to make it mandatory as well.

9)b) Not Enough Time to Comment on SOON Program

- 1. Comment:** The SOON program is an 11th hour deal that's just recently come through. It's really not right for consideration. It hasn't been thought through. It hasn't been vetted. There have been no workshops on it. We would recommend that that proposal needs further consideration before it's adopted. (GC5)

Agency Response: We disagree. Since the board hearing on July 26, 2007, ARB staff has worked closely with the South Coast Air Quality Management District (SCAQMD), a non-attainment district for federal and state standards, and affected fleets to modify and refine the SOON program. After significant revision, ARB staff released the SOON language in the Second Notice of Public Availability of Modified Text on February 5, 2008, and extended the required 15-day public comment period to 30 days, allowing additional time for stakeholder comments. Staff believes the revised SOON program will help the SCAQMD and other non-attainment districts to meet their attainment deadlines, while not imposing additional financial hardship on affected fleets.

Additionally, ARB staff has been working closely with the SCAQMD as they develop their SOON district guidelines. A SOON working group has been formed to aid in this guideline development process, and includes ARB staff, SCAQMD staff, and affected fleets that operate within the South Coast Air District. ARB staff will continue to work with the SCAQMD on their SOON district guidelines, and will also encourage other districts interested in the SOON program to develop similar SOON working groups which include stakeholder involvement.

9)c) Taxpayers Should Purchase the Emissions Reductions

- 1. Comment:** If additional emissions reductions are needed beyond those that will be achieved by the in-use off-road diesel vehicle regulation, taxpayers should purchase them. (ARA1)

Agency Response: The Board directed staff to add the Surplus Off-Road Opt-in for NOx (SOON) program to the regulation for the purpose of using public funds to achieve additional NOx emission reductions beyond those that will be achieved by the in-use off-road diesel vehicle regulation. As noted in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008, SOON will be funded by air districts who opt into the program. In air districts that opt into the SOON Program, fleets that volunteer or are required to participate in the program will apply for public funding for actions necessary to reduce NOx emissions further than required by the statewide off-road regulation. Fleets that apply but do not receive requested SOON program funding are not required to take action beyond compliance with the statewide off-road regulation.

9)d) Funding of SOON by ARB

- 1. Comment:** ARB should provide SOON funding. Without ARB participation in funding the enhanced program, the Valley would have to divert funding from other equally impactful emissions reductions projects which will greatly diminish the benefits of the enhanced program.
(FRESNOCITY)

Agency Response: The SOON program was created to achieve NOx and PM emission reductions beyond those expected from compliance with the in-use off-road diesel vehicle regulation. The amount of emission reductions achieved will depend on the level of funding in each air district, on the cost-effectiveness of the SOON projects funded, and on how the SOON program is assumed to interact with the statewide in-use off-road diesel vehicle regulation. If a district opts into SOON, and uses their currently available incentive monies, that will preclude other use of their incentive monies. If equally or more cost-effective projects are funded through the SOON program, the overall emissions reductions for that district will remain the same, or increase. However, if a district cannot fund more cost-effective projects through the SOON program, we encourage the district not to fund the SOON program, and instead to use their funds for most cost-effective projects.

Additionally, funding from ARB's Carl Moyer Program is available for fleets from any district in the state, and can be used to fund the SOON program. However, ARB staff will not be allocating resources specifically to districts which opt into the SOON program, because this would unequally localize benefits and would reduce funding for fleets in other districts.

9)e) Adopt 3-Year Fleet Averages in Conjunction with SOON

- 1. Comment:** We respectfully request that the Board authorize the 3-year fleet average when determining compliance. The advantages of a 3-yr fleet average:
 - Allow fleet owners maximum flexibility to manage transition of the fleet
 - Allows more engine technology options to achieve compliance including Tier 4 Interim (2011) and Tier 4 Final (2014) options.
 - Assures emissions reduction are achieved every year by using a "reasonable further progress" increment (40% of required improved in initial 2 years)
 - Enables contractors to participate in the SOON program in South Coast and San Joaquin Valley air districts.
 - The early over-compliance program (SOON) in South Coast and San Joaquin Valley achieves significantly more NOx and PM reductions statewide than originally envisioned by the staff proposal.

- Without the three year average goals most contractors will not have the resources necessary to participate in the SOON program, and their air districts will miss their 2015 EPA ozone compliance dates.
 - The Soon program and the three-year fleet average milestones are part of a carefully crafted incentive plan to achieve early, significant emission reductions that go beyond that envisioned by the CARB staff proposal. (CBCC2)
2. **Comment:** We encourage you to adopt the SOON program, and want you to look at the compliance alternatives, to go from a one-year regulation that has to be met, to a moving target within those three years with some minimum targets. Let the industry figure out how to comply. They're willing to get there. And this is the first chance of find a blended point where everybody can come together. (CURTIN)
3. **Comment:** We propose the three-year milestone measures in addition to the SOON plan, with annual reporting remaining in place. We believe SOON gives the contractors an opportunity to have more flexibility and how they manage their fleets, and accommodates the needs of the Air Resources Board, the construction industry, and the air district.

In order to demonstrate reasonable further progress, the regulation should take the difference between the two milestones of 2011 and 2014 and require achieving 40 percent of it within the first two years. Because the starting times for the fleets are staggered with the large in 2010, the medium in 2013, and the small in 2015, if you keep the three years staggered, you'll have one of the fleets in a hundred percent compliance every year, if you stagger the start time. So that will guarantee that progress and emissions are still being reduced every single year, rather than putting them all on the same three year cycle.

Two year particulate increments do not give the contractors any real flexibility. From a business planning standpoint, compliance with the regulation involves substantial financial decisions. Businesses decide several years in advance what they're going to alter, what they're going to replace, what they're going to repower. And we believe you have to keep them on the same PM and NOx cycle, or it is going to require much more complicated reporting. We have timed the proposed changes to regulation incremental reporting periods to match the release of new tiers of engines, and so business are able to buy new equipment that actually meets the standards, rather than having to repower or retrofit something that they're going to have to replace later on.

From our standpoint you can't uncouple the three year milestones from the SOON program because that three-year milestone that gives the affected contractors the ability to manipulate their fleets in order to participate in

the SOON program. And participation in the SOON program isn't free, as businesses have to match the cost of those engines and they're going to have to pay a hundred percent of the cost of those particulate traps. It has some advantages in that later on when those equipment come back in the fleet, they'll be able to take credit for it. But they're going to have to do earlier compliance than they normally would as the SOON program is going to start before your starting times. We think that given enough flexibility contractors can get to those goals and still achieve what it is the air districts want to do, but it's important that we tie together the three year fleet averages with the SOON program.

The net result of SOON is a significant early reduction, much more flexibility for an industry that can make better decisions on how and what they retrofit, what they repower, what they replace, and what they retire, and give them the chance to figure that out in three year windows matching their business plan. You're going to get a far better result, I believe, than with the annual forced decision-making that you're imposing on them with your annual fleet averages. (CBCC4)

Agency Response: ARB staff analyzed the effect of three year average goals with various incremental improvements in the first two years and compared the emissions benefits expected to those expected from annual requirements. The results of the analysis showed that the three year average goals lowered the emissions benefits of the regulation, and caused a significant increase in emissions during the first two years of each three year reporting period. This analysis is available in Attachment 3: Analysis of Alternatives to the Proposed In-Use Off-road Diesel Vehicle Regulation to the Notice of Public Availability of Modified Text and Availability of Additional Documents on December 21, 2007. Table III-A-9)-1 shows the reduction in emissions benefits incurred by using three year average goals.

Table III-A-9)-1

Compliance Interval	Compliance Years	Interim Year Requirements	2015 Loss in Benefit
3-yr targets-80%	2011, 2014, 2017, 2020	80%	-3%
CIAQC 3-yr Targets	2011, 2014, 2017, 2020	20% in 2010, 40% in second yrs	-17%
3-yr targets	2011, 2014, 2017, 2020	100% in 2010, 40% in second yrs	-11%
2/3-yr targets	2010, 2012, 2014, 2017, and 2020	none	-8%

Three year averages might allow some fleets to more easily participate in SOON in the first two years, but on the third year, full compliance with the statewide off-road regulation in addition to meeting a SOON target emission rate would magnify costs over a short period and could result in a financial or logistical hardship on fleets that did not choose to spread out the cost of compliance. The flexibility of the three average reporting period produces the effect of amplified emission reductions in the final year. For example, using a three year target, with 40% compliance requirement over the initial two years, the third year would require actions meeting 60% of the emissions reductions necessary in the three year period. This amounts to 180% of the emissions reductions required in any single year using annual requirements.

While the staff recognizes that the added flexibility could be used by many resourceful fleet owners to plan the transition of their equipment or wait until the release of Tier 4 engines, the overall effect of the change would encourage the delay of implementing emission reductions, and result in many fleets dealing with the majority of emissions reduction requirements in a relatively short period. Furthermore, three year average goals could negatively impact the availability of retrofits and engine repowers during the final compliance years as fleets seek to complete the majority of the actions necessary over the three reporting period in the third year.

Staff does not agree that implementing a three year plan would simplify the process for planning or reporting fleet averages to CARB. Instead of consistent annual targets, the three year average alternatives each vary over the three year period, and calculating necessary emissions reductions in a given year would require factoring in actions taken in past years and those projected in future years up to the third compliance year. While potentially more flexible, as discussed above, the three year average reporting and planning would not be less complicated in most cases.

Staff does not believe the additional emissions reductions outlined in the SOON program provide justification for lowering the stringency of the regulation and lowering emissions reductions across the state with a three year average reporting period. By implementing a three year average regulation, the purpose of the SOON program, to provide more stringent regulations in specific air districts by actions covered through local public funding, would be undermined by the overall increase in emissions in every district in the state.

10. Compliance Model

- 1. Comment:** The ARB staff analysis is highly sensitive to changes in assumptions about things -- about items and various parameters that really aren't documented or are empirically based. (M3CON)

2. Comment: A series of scenarios were run representing changes in the ARB Staff assumptions. These scenarios indicated how sensitive the cost results are to underlying assumptions about parameters for which we have little or no information. Using 67 percent higher new equipment prices, a 75 percent lower proportion of the fleet that can be repowered and a 45 percent lower normal retirement rate based on manufacturer sales data, the total net present value cost rises to \$12.9 billion, equivalent to \$571 per horsepower. The annual cost is \$1.296 billion for 2010 to 2020 and \$1.366 billion for 2010 to 2030. This is an increase of 300 percent over the staff estimate. (CIAQC6) (AGCA3)

Agency Response: We disagree. At a June 17, 2007, public workshop to discuss the discrepancy between industry's and ARB's estimate of the regulatory costs, the economic model developed for CIAQC (CIAQC Model) and the model developed and used by ARB staff (ARB Model) were compared and the tables set forth below were presented.

The ARB Model uses a "bottoms up" approach wherein the model evaluates 200 actual California fleets representing 10,152 vehicles over the years 2008 through 2030. The model estimates likely actions taken by these fleets over this period and then scales up the results to a statewide estimate. A base case is made representing a no regulation scenario, and another scenario is run representing likely actions taken to comply with the regulation. In modeling the fleets, the fleets are categorized into a matrix of age versus size. The model, when running the full 200 fleets with 10,152 vehicles over the years 2008 through 2030, will generate 223,344 rows of data for the base case and an equal number for the scenario case. These data, almost a half-million rows, were then compared to determine the cost and benefits associated with the regulation.

Because the ARB Model uses highly disaggregated data, various perturbations impact selected data points on an individual basis and do not unduly impact unrelated data points. For example, the turnover rate for a 0 to 4 year-old fleet can be changed with no impact whatsoever to fleets of any other size.

Alternatively, the price of retrofits for engines over 600 horsepower can be changed with no impact on the cost of retrofits for engines of other sizes.

On the other hand, the CIAQC Model is a "top down" model that evaluates only the entire (aggregate) statewide fleet without distinguishing different impacts on different fleets. Unlike a bottom-up approach in which changes are targeted to disaggregated data points, a parameter change in a top-down model will impact the entire statewide fleet, even when that change should not have an effect; thus, even very small parameter changes may have a large (and artificial) impact.

As shown below in Table III-A-10)-1, the ARB Model is not particularly sensitive to various perturbations of the parameters upon which ARB and the commenters disagree. On the other hand, as shown in Table III-A-10)-2, the CIAQC Model is

very sensitive to changes in input values. For example, as shown in Table III-A-10)-1, the change in the ARB's estimated \$3.0 - \$3.4 billion cost of the rule when new vehicle prices were doubled was only \$0.1 billion, an increase of only 3 percent. On the other hand, as shown in Table III-A-10)-2, the change predicted by the CIAQC Model, based on an estimated cost of up to \$13 billion, when new vehicle prices were increased by 60 percent was a \$4.3 billion, an increase of 33 percent, or 10 times more sensitive than the ARB model. This is likely due to the fundamentally different approaches used in the ARB and CIAQC models.

Based on our comparison, we do not believe that the CIAQC Model is an accurate representation of the California off-road fleet, and, unlike the ARB Model, does not have the capability of evaluating changes in the fleet in a realistic manner such that it will yield valid results. Staff believes the high sensitivity of the CIAQC Model is an inherent flaw of the modeling approach utilized, and that the commenters' estimate that the regulation's cost could be as high as \$12.9 billion is greatly inflated.

Table III-A-10)-1

Factor Evaluated for Sensitivity	Potential change in ARB estimates using staff model (billions)
Tier 0 completely devalued	+ \$0.4
Double PM retrofit costs for high hp	+ \$0.2
Wide utilization of early credit	- \$0.2
Public fleets excluded	No Change
Increase new vehicle prices 60 percent	+ \$0.1
More small fleet and fewer large	- \$0.02
Repair savings from newer vehicles	Under review

Table III-A-10)-2

Assumptions Made in Industry Analysis	Effect in Industry Model (billions)
Vehicle attrition rate for oldest vehicle category applied to all vehicles	\$2.3
Assumed no fleets would meet the fleet averages (always maximum turnover and PM retrofits)	\$1.5
New vehicle prices assumed to be 60 percent higher	\$4.3

Assumed engine turnover to reduce PM rather than use exhaust retrofits (engines >150 hp)	Not quantified
Assumed purchasing of only new vehicles rather than a mix of new and used	Not quantified
Total	\$8.1

10)a) Based on Too Few Fleets

1. **Comment:** AGC believes that ARB's "representative" fleet of construction equipment is not, in fact, representative of the statewide construction fleet. To the contrary, this fictional fleet is newer than the actual fleet, and would therefore cost less to bring into compliance. By basing its economic analysis on an unrealistically new "representative" fleet, ARB systemically understates the cost of compliance. (PILCONIS) (AGCA3)
2. **Comment:** While the emission inventory shows that 39% of the vehicles are Tier 0 in 2008, the survey used to compute the compliance costs shows 49% are Tier 0, or one-quarter higher. Compliance costs are lower for fleets with older equipment because that equipment is more likely to be retired sooner. As a result, the Staff cost estimate is biased downward. (AGCA3) (CIAQC6)

Agency Response: The fleets ARB used to estimate costs represent a substantial portion of the California off-road vehicle fleet. We acknowledge that the sample fleets are slightly older than the entire fleet of off-road vehicles in California. Compliance costs for older fleets are generally higher than those for younger fleets. Therefore, we believe the cost estimate generated by modeling the sample fleets' behavior is accurate, and, in fact, may slightly overestimate the cost of compliance and therefore provides a conservative cost estimate.

Commenters have stated that the fleet data ARB relied upon to estimate cost were either too new and therefore underestimated cost or too old and therefore underestimated cost. (In fact, one commenter claimed that ARB's fleet data were both too old and too new.)

ARB fleet data upon which cost estimates were made were based upon fleet data from the San Diego Engineering and General Contractors Association (EGCA), the Construction Industry Air Quality Coalition (CIAQC), an ARB-sponsored survey of public fleets and other fleets that volunteered actual fleet data. None of the fleets is fictional; all are fleets actually operating in California.

As discussed in Chapter XI and Appendix H of the Technical Support Document, the 200 fleets are comprised of 10,152 vehicles and 2,163,669 horsepower, almost ten percent of the horsepower and six percent of the vehicle numbers of the Californian construction equipment. The discrepancy between the percent of

vehicle numbers and percent of horsepower indicates that there may be a greater proportion of higher horsepower engines in the 200 fleet sample than in the statewide inventory. Because equipment with larger horsepower engines are typically kept longer than equipment with smaller horsepower engines, it is understandable that average age of the 200 fleets is older than the statewide inventory.

The average age by horsepower of the 200 fleets is 12.7 years and average age by horsepower of the statewide fleet is 10.3 years. (Average age by horsepower is explained in the next comment.) Also, as the commenter has pointed out, 49% of the vehicles in the 200 fleets are Tier 0 and only 39% of the statewide inventory are Tier 0 in 2008. However, the 200 fleet sample provides a conservative estimate of the cost of the rule, i.e., it may overestimate the cost of the rule, since older fleets will incur greater costs to comply with the rule.

Commenters AGCA3 and CIAQC6 have stated that compliance costs are lower for fleets with older equipment; this is false. As shown in Chapter XI of the Technical Support Document, there is a clear correlation between the age of the fleet and the cost of compliance. This is easily understood using the following example. A four-year-old or newer fleet will likely meet the fleet average for both NOx and PM throughout the life of the regulation without doing anything different from the fleet's normal business practice. Therefore the fleet will have minimal reporting and other administrative costs. On the other hand, a 20-year-old or older fleet will likely have to do the maximum turnover and retrofit through the year 2020, incurring substantial costs for equipment and retrofits beyond the fleet's normal practice. The older fleet will pay more than the newer fleet to comply with the regulation.

Thus, the fleet ARB used to estimate costs is a substantial portion of the California construction industry fleet and, if anything, its use overestimates the cost of compliance and therefore provides a conservative cost estimate.

3. **Comment:** ARB bases its analysis on an aggregation of 22 fleets that ARB staff selected from a 200-fleet database that ARB selected from two surveys of California fleets...These data have significant biases that render them inappropriate for use as ARB's model for the California construction fleet. ARB's 22-fleet database has an average vehicle age of 10.74 years, whereas ARB's 200-fleet database has an average age of 12.05 years. (PILCONIS) (AGCA3)

Agency Response: We disagree. The 22-fleet sample fleet has the same average age as the combined 200 fleets and does not introduce any bias that would reduce the estimated cost of compliance.

Fleet average age can be calculated in two different ways, each having an appropriate use. Average age can be calculated by count or by horsepower. For

example, a fleet consisting of a 15-year-old 1,000 horsepower engine and a 5-year-old 100 horsepower engine would have an average age by count of:

$$(15+5) / 2 = 10 \text{ years};$$

however, this same fleet would have an average age weighted by horsepower of:

$$(15*1000+5*100) / 1100 = 14.1 \text{ years}.$$

In most instances, the average age by count and the average age by horsepower are very similar for a fleet. If there is a difference, because equipment with larger horsepower engines are typically kept longer than equipment with smaller horsepower engines, the average age by count will typically be lower than the average age by horsepower.

Average age by horsepower is the appropriate measure to compare the sample with the full 200 fleets since compliance with both the BACT and fleet average targets are based upon the total horsepower in the fleet.

The average age by horsepower of the 22 -fleet sample is 12.7 years, and the average age by horsepower of the full 200 fleet is 12.7 years. Thus, there is no bias by using the sample fleet since turnover and retrofit rate of the 22-fleet sample would be similar to the 200 fleets.

As discuss in Appendix H of the Technical Staff Report, staff did use average fleet age by count in calculating replacement vehicle age; however this was used to bin fleets in four- year increments with very little difference in binning based on average by count versus by horsepower. In instances where a fleet's lower average by count dropped it into a younger bin than average by horsepower, the effect would be to choose a newer replacement vehicle at a higher cost. Thus, the cost of compliance may be slightly overestimated using ARB staff's method.

10)b) Disproportionate Number of Public Fleets

- 1. Comment:** ARB's 200-fleet database does not appear representative of the overall statewide fleet because the 200-fleet database includes a disproportionate number of public fleets, which typically have newer vehicles. (PILCONIS) (AGCA3) (CIAQC1) (CIAQC6) (AGCA3)
- 2. Comment:** There are two additional issues in the Air Board Staff Report that I think that are particularly important. The first one is that of the 200 fleets that they use, 155 of them are public fleets. Public fleets are actually only 5 percent of the horsepower in the state, yet they represent over 75 percent of ARB's sample dataset. Public fleets actually have a purchasing strategy that relies heavily on buying new vehicles, because

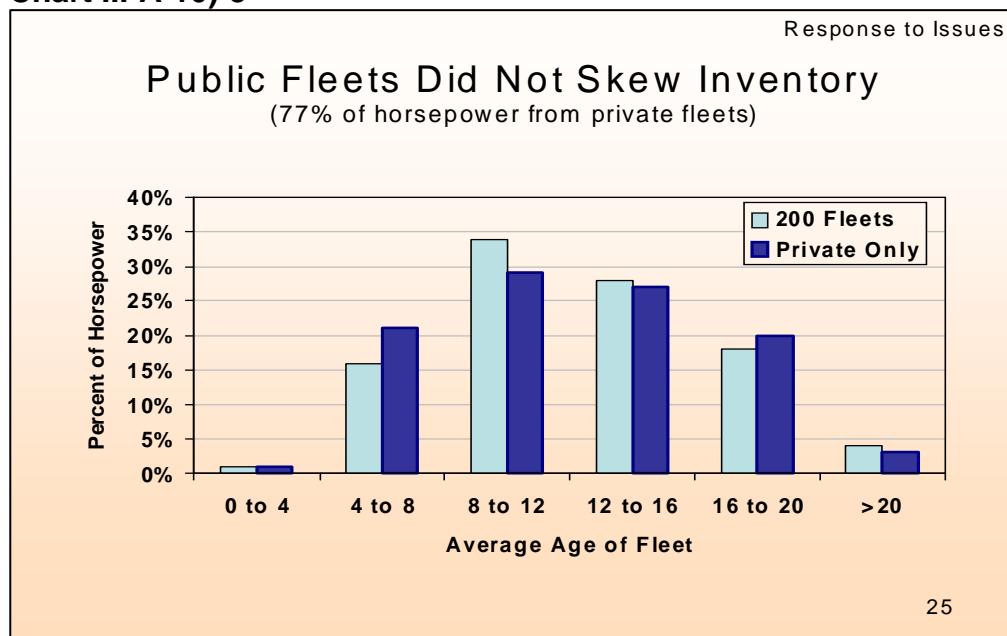
they use bidding processes in order to buy those vehicles. That's very different from private fleets. (M3CON)

3. **Comment:** Public fleets rely mostly on new vehicle purchases, and thus are much more likely to have newer equipment than private fleets. Because in the ARB analysis, the samples were not weighted for their relative shares of the statewide fleet, this introduces a significant bias toward underestimating the age of the fleets, and thus underestimating potential costs statewide. (CIAQC1)

Agency Response: We disagree. As discussed in the July 25 Board Hearing, although most of the fleets in the 200 fleet sample were indeed public, over 75 percent of the horsepower within the 200 fleet sample belonged to private fleets. We also confirmed that the use of the public fleets did not skew the age distribution of the sample.

The chart III-A-10)-3 below compares the age distribution from the 200 fleets used by staff to predict the regulation's emission benefits to the private fleets contained in that same sample. The age distributions are almost indistinguishable; in fact, if anything, the public fleets were on average slightly older than the private fleets used. Thus, the cost of compliance may be slightly overestimated.

Chart III-A-10)-3



10)c) Repowering's Effect on Useful Life Not Addressed

1. **Comment:** How the life of the equipment is affected by repowering has not been addressed by ARB, and that aspect is ignored in both the Staff

analysis and the Construction Industry Cost Model (CICM). Any adjustment would lead to increased costs since repowering is presumed to extend life the same amount as replacement in both analyses. Therefore, we believe ARB underestimated the cost of the regulation. (CIAQC1)

2. **Comment:** ARB's modeling relies on unrepresentative data or unsupported assumptions: The proportion of the equipment fleet that can be repowered to meet Tier 2 and 3 emission standards, much less achieving Tier 4 levels.

Repowering costs vary by whether the new engine will meet the Tier 2 or 3 standard versus Tier 4. The ARB Staff and Justice and Associates have arrived at roughly similar estimates and differences. However, the estimate of what might be repowered differs substantially. The ARB Staff apparently presumes that all equipment larger than 250 HP can be repowered based on the single template model it provided to CIAQC and its Technical Supplement; however Justice and Associates and CIAQC members have documented a much restricted list of equipment that can be repowered—we used 25% as being able to be repowered as representative. For the ARB Staff base case presented here, the analysis used 100% repowering as the representative option, although a much smaller proportion was actually repowered. (CIAQC6) (AGCA3)

Agency Response: As discussed further in Chapter III-A-3 of this FSOR, we believe the Staff Report and Technical Support Document present an accurate estimate of the cost of the regulation. We believe there is no cost impact due to the age of repowered vehicles being different than new vehicles, and - in any case – any cost increase for repowers would be unlikely to significantly affect the overall estimate of the regulation's cost because we expect that repowers will occur on less than four percent of the fleet.

Staff estimated that less than four percent of the vehicles affected by the rule would be repowered over the life of the rule, far less than CIAQC's estimated 25 percent. As discussed in Appendix H of the Technical Support Document, the model used by staff to estimate the cost of the rule would preferentially repower vehicles over 250 horsepower and that were "relatively new". The model only repowered engines to the Tier 2 or Tier 3 standard, and did not repower vehicles that already had Tier 4 engines. A vehicle was relatively new if it fit the criteria of equation 10 of Appendix H. To illustrate the effect of equation 10, in a simple case (where the useful life factor = 1), a vehicle would be repowered if it were over ten years old but still had ten years or better on its useful life. The criteria effectively limited repowers to equipment with the useful life of 26 years or greater (typical of large equipment like scrapers and rubber tired dozers) in the oldest fleets in the early years of the rule. (This is consistent with industry practice, where it is more cost effective to repower than replace a \$1 million scraper when it still has significant useful life left.)

Upon repower, the vehicle's relative life was updated using the model year of the repowered engine. Given that repowers only occurred on vehicles that were "relatively new" and had over 10 years useful life left, these vehicles would be unlikely to be replaced or repowered again for the life of the regulation. Even if the vehicle were replaced, that cost could not be attributed to the regulation because it would be a cost of normal turnover. Overall, we acknowledge that the actual life of the vehicle may be less than the modeled age of the repowered engine; however, this would not have any impact on cost estimates under the regulation.

10)d) Extrapolation from 22 Fleets

- Comment:** An important issue not discussed adequately in the ARB Staff Report or its Technical Support Document is how the model extrapolates from the individual 22 fleets up to the statewide fleet. (CIAQC1) (CIAQC6) (AGCA3)

Agency Response: We disagree. The issue was discussed in detail in Appendix H of the Technical Support Document

Table III-A-10)-4 represents the percent horsepower distribution (by average age and fleet size) of fleets compiled from data from over 200 fleets. The weighting for each age and size bin was calculated using Equation 1.

$$PercentAgeSizeBin = \frac{\sum TotalHorsePower(AllFleetsInAgeSizeBin)}{\sum TotalHorsePower(All200Fleets)}$$

Equation 1:

Table III-A-10-4: Horsepower Distribution by Fleet Age

Percent Horsepower Distribution in the Two Hundred Fleets						
Fleet Size	Average Fleet Age					
	0-3.999	4-7.999	8-11.999	12-15.999	16-19.999	20+
Small	0.04%	0.36%	0.65%	0.65%	0.57%	0.37%
Medium	0.07%	0.53%	1.02%	0.22%	1.49%	1.29%
Large	0.58%	15.43%	32.41%	26.66%	15.69%	1.96%

The 200 fleets were assumed to represent the statewide fleet, thus the statewide costs and benefits were estimated by taking a weighted average of the costs and benefits of the 22 fleets. Each selected fleet within an age size bin was assumed to be representative of the age size bin as a whole and therefore the percent age size bin was taken as the weighting factor for the fleet. The statewide percent reductions in NOx and PM emissions for each calendar year were calculated using Equation 2.

Equation 2:

$$\text{PercentStatewide Reductions} = \sum_{i=1}^{22} \text{Percent Reductions}_i * \text{PercentAgeSizeBin}_i$$

The statewide reductions in NOx and PM emissions for each calendar year were calculated using Equation 3.

Equation 3:

$$\text{Statewide Reductions} = \text{PercentStatewide Reductions} * \text{StatewideInventory}$$

The statewide dollar per horsepower cost was calculated using Equation 4.

Equation 4:

$$\text{StatewideCostPerHorsepower} = \sum_{i=1}^{22} \text{PVTotalAnnualCost}_i * \text{PercentAgeSizeBin}_i$$

The cost of the regulation was calculated using Equation 5.

Equation 5:

$$\text{StatewideCost} = \text{StatewideCostPerHorsepower} * \text{TotalStatewideHorsePower}$$

Where: TotalStatewideHorsePower = From the ARB Off-Road Inventory (ARB, 2006).

As an example of weighting a fleet from the 22 fleets, suppose a large fleet with an average age of 26 years incurred a cost of \$160 per horsepower over the life of the rule. As shown in Table III-A-10)-4, the large fleets with an average age greater than 20 years would represent only 1.96% of the statewide fleet.

Therefore, as indicated in equation 25, the increment of the statewide cost that the sample fleet would represent would be only $\$160 * 0.0196 = \3.14 per horsepower. This increment would be added to increments from all of the other sample fleets representing the other age size bins to yield the total statewide cost in dollar per horsepower; this was multiplied by the total statewide horsepower to yield the total cost of the rule.

10)e) New Purchasing Practices for Fleets

1. **Comment:** ARB Staff assumes that fleets will continue to buy equipment in the same proportion of new and used as they have in the past. However, to meet the higher emission targets, more new equipment of Tier 3 and Tier 4 levels will have to be introduced into the statewide fleet. To achieve this means that individual fleets will have to buy a higher proportion of new equipment than in the past. The Staff Report fails to discuss how this rebalancing of purchasing practices has been accomplished. (CIAQC1) (CIAQC6) (AGCA3)

Agency Response: We disagree. As discussed in Appendix H of the Technical Support Document; ARB staff determined after modeling that fleet owner business practices would likely change under the regulation, with fleet owners buying slightly newer vehicles as shown in Table III-A-10)-5. The age of the replacement vehicle is assumed to be slightly newer than in the base case without the rule.

Table III-A-10)-5: Replacement Vehicle Age By Fleet Age

Fleet age	Replacement Vehicle Age Baseline	Replacement Vehicle Age Scenario
< 8	0	0
8 to < 12	2	1
12 to < 16	4	2
16 to < 20	6	3
20 plus	8	4

We found that most fleets would comply by purchasing slightly newer, used vehicles, at a faster rate and that each fleet will turn over vehicles each year until either the fleet meets the fleet average targets or does the maximum required under the regulation's BACT provisions.

10)f) This section was intentionally left blank.

10)g) Count of Fleet Class Sizes Inaccurate

- Comment:** The ARB staff does not have an accurate count of firms falling into different fleet class sizes, i.e., small, medium and large despite this data being available from other state agencies. The ARB could determine more accurately how many firms will qualify as “small” businesses, the distribution of financial characteristics in the industry, the relationship of employment force to financial characteristics and other important parameters for measuring the distribution of regulatory costs and impacts. A more refined analysis that could better characterize the distribution of fleet characteristics could be done with firm-specific Employment Development Department data. As a state agency the ARB could gain access to these data, with firm names obscured, and then be able to more precisely estimate the range of fleet characteristics and resulting regulatory impacts on the industry. (CIAQC1) (CIAQC6) (AGCA3)

Agency Response: We disagree and believe we used an accurate estimate of how fleets are divided into various fleet sizes. Staff does not believe that using financial data as a surrogate for total horsepower is more accurate than getting actual data from fleets on their vehicles' horsepower. Staff estimated the fraction of fleets that would fall in the small, medium, and large fleets based upon an ARB survey which included data from AGCACIAQC, a TIAX fleet survey, and other actual fleet data volunteered by fleets. Complete data were combined into a 200 fleet sample database; all are fleets actually operating in California. As discussed

in Chapter XI and Appendix H of the Technical Support Document, the 200 fleet sample is comprised of 10,152 vehicles and 2,163,669 horsepower, almost ten percent of the horsepower and six percent of the population of the Californian construction equipment.

It is also relevant to note that, due to changes in the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, the definition of small fleet in the regulation is no longer based on whether or not a fleet qualifies as a small business. Therefore, it is not necessary to gather data on fleet's financial characteristics to determine if they qualify as small businesses.

If the commenters see a discrepancy between the 200 fleet sample and their own fleets, that is most likely due to a greater representation of AGCA and CIAQC fleets having larger and older fleets than the average statewide fleet.

10)h) Model Not Appropriate for Mining

- 1. Comment:** Our fleet does not fit the ARB model, because repowering is not a viable option due to the long lead times required, and because quarrying uses much more powerful equipment than construction. (BMM2)

Agency Response: The ARB model estimated a range of costs based upon fleet composition and age; older, larger fleets are likely to have higher costs to comply with the rule than newer, cleaner fleets. However, the model estimated that less than 4 percent of the effected vehicles would be repowered during the life of the regulation. If repowering is not available to mining operations that does not, in itself, represent a situation that different from the fleets in the model. Also, incorporated into the model are the fleet targets, including significantly easier targets for the highest horsepower engines. However, we do acknowledge that mining fleets may operate some very large horsepower vehicles not represented in the 200 fleet sample. See also the response in section III-A-6)a)vi)2) of this FSOR regarding why we do not believe the regulation is unfair for quarrying operations.

11. Enforcement

11)a) Regulation Difficult or Impossible To Enforce

- 1. Comment:** The regulation will be difficult or impossible to enforce. There is no workable enforcement mechanism. (ECCO2) (GC2) (CAMARILLO5)
- 2. Comment:** The small amount of emission reductions gained by this imperious command and control approach will be lost because of extended delays in implementation caused by major enforcement problems. (CIAQC2)

- 3. Comment:** Contractors need a regulation where the enforcing agency can enforce both fairly and consistently. (CALPASC1)
- 4. Comment:** There are so many problems with the proposed regulations, from unavailable mandated technology to insurmountable enforcement problems. (CEC)
- 5. Comment:** There will be an outcry beyond comprehension. We will not be forced out of business without a fight. Cheating will be the norm, as businessmen attempt to forestall the inevitable. (DCCI)

Agency Response: We disagree. Staff is confident that we will be able to effectively and fairly enforce the regulation. Chapter X of the Staff Report outlines staff's planned enforcement strategy for the regulation, and Section G of Chapter XII of the Technical Support Document provides additional detail. In short, the two keys components to enforcement of the in-use off-road diesel vehicle regulation will be the annual reporting and the equipment identification number (EIN). The reporting will allow staff to determine if fleets have met the fleet average targets or complied with the BACT requirements. Fleets will be required to report information about each vehicle, its engine data, its model year, as well as the actions taken to comply with the regulation such as any repowering or retrofitting. For vehicles claimed as low-use, owners must report the hour-meter readings.

In addition, each vehicle will have its EIN displayed prominently on the side of the vehicle. When ARB inspectors are in the field, they will be able to link the vehicle EIN to whatever action was claimed for that vehicle. They will be able to ascertain if the vehicle does not have the proper engine installed, or is not outfitted with the retrofit claimed. Even though in most cases inspectors won't be able to view an owner's entire fleet all at one time, inspectors will be able to verify the accuracy of the reported information for whatever vehicles they encounter.

ARB inspectors will use a variety of opportunities to find and inspect off-road vehicles, including audits of facilities such as landfills, mines, and recycling facilities where equipment is generally captive. They will also inspect construction sites or off-road vehicles they encounter being transported by truck, as well as complaints from the public. If ARB inspectors find vehicles that are subject to the regulation that are not labeled with an EIN, then that would be an indication of potential noncompliance. Enforcement of the idling portion of the regulation will be conducted similarly to enforcement of ARB's commercial vehicle and school bus idling rules, which rely in part on complaints from the public to trigger inspections by ARB field inspectors and further enforcement action. Violations of the regulation may result in substantial penalties, as set forth in the Health and Safety Code. These penalties can range from \$500 per vehicle per day of violation up to \$40,000 for a person who violates the diesel PM

part of regulation, knew of the emissions, and failed to take corrective action (Health and Safety Code sections 42400.2 and 42402.2.).

Also, Assembly Bill (AB) 233 will help ensure there is consistent, comprehensive, and fair enforcement of the regulation. AB233 requires ARB to review its enforcement program for its entire diesel PM air toxic control measures, including the in-use off-road diesel vehicle regulation, and develop a strategic plan anticipating enforcement needs in future years. The findings of this review must be submitted to the Legislature by January 1, 2009, and every 3 years thereafter. The plan compiled to comply with AB233 will include details on the funding of enforcement activities and the number of staff being added.

While staff acknowledges that it will not be possible to catch every instance of noncompliance, staff believes the proposed enforcement structure will be effective and will ensure a high level of compliance with the regulation.

See Chapter III-A-2 of this FSOR for responses regarding technology availability.

6. **Comment:** CARB also exempts companies from having to buy new equipment, so if no repower or used piece is available, the company is required to do nothing. We believe this provision will be almost impossible to enforce because this rule covers such a wide variety of equipment and engine classes (TA)

Agency Response: We disagree. To utilize the specialty vehicle provision to avoid turnover, a fleet will have to certify to the ARB that it did an extensive search for a cleaner, used vehicle and that none was located, and that no repower solution was available. Staff plans to release guidelines regarding the documentation necessary to demonstrate lack of availability of repowers and used vehicles during the course of implementation of the regulation. .

Falsifying search documentation for replacement vehicles would constitute willful violation of the PM portion of the regulation, carrying a fine up to \$10,000 per vehicles per day. Willful violation of the NOx portion, the fine can be up to \$500 per vehicle per day. Staff believes that the potential fines will provide fleets incentive to comply with the turnover portion of the regulation and to not misuse the specialty vehicle provisions.

7. **Comment:** This will cause an unlevel playing field in the construction industry and the proposed rule could substantially disadvantage the companies who operate the cleanest, most reliable fleets. (GC1)
8. **Comment:** The regulation will be difficult to enforce. The regulation will impose high costs, and if it is not adequately enforced, then contractors who do comply will be undercut by those who are not complying and will therefore have great difficulty in acquiring contracts. Contractors must be

able to pass on the regulation's costs in order to stay in business.
(CAMARILLO2)

9. Comment: In order to maintain an even playing field, ARB enforcement of the off-road regulation must be evenly applied and not concentrated only on high visibility projects and the contractors performing those jobs. The staff report does not indicate how ARB is going to outreach, or find those contractors who do not report or comply with the regulation. There is no mechanism proposed to verify that reports are accurate. Nor is there any indication of how CARB even intends to compile a list of contractors with off-road equipment. (CIAQC7)

10. Comment: If you make the first years of compliance less finically burdensome we could still compete in the market place. That will give the Air Resources Board time to work out the enforcement issues that are going to be critical in creating a level playing field. (CAMARILLO4)

11. Comment: The implementation of regulations and compliance will create "fertile grounds" for unfair policing. (ESCOBEDO)

12. Comment: We're concerned about the lack of a good enforcement plan built into the regulation. I know that it's there, but it's not a good plan. We are very concerned that we're going to comply and others won't (GC4)

13. Comment: Air Resources Board needs time to work out the enforcement issues that are going to be critical in creating a level playing field.
(CAMARILLO8)

Agency Response: We agree that there needs to be a level playing field among all fleets to make sure that no one is disadvantaged by complying with the off-road rule, and ARB is committed to effective enforcement of the regulation. See the response above at the beginning of Chapter 11 of this FSOR regarding the enforcement mechanism that ARB is putting in place.

ARB has added staff for implementation and enforcement of the off-road regulation. In addition, a newly adopted law, Assembly Bill (AB) 233 will help ensure there is consistent, comprehensive, and fair enforcement of the regulation. See the response above at the beginning of Chapter 11 of this FSOR for more information on fines and penalties associated with noncompliance.

14. Comment: The complexity of this rule leaves many opportunities for companies to make legitimate mistakes to purposefully submit false data, or to not comply at all. Industry has been given no assurance that CARB will have a support staff large enough to be able to catch these types of errors, and therefore has every reason to believe that competitive discrepancies will be created. (TA)

Agency Response: During implementation of the regulation, ARB enforcement staff will utilize enforcement discretion. We recognize that the regulation is complex, and if a fleet attempts to comply and finds itself out of compliance through no fault of its own, enforcement staff will take that into account. Section 2449(h) of the regulation states that when assessing penalties, the Executive Officer will consider the willfulness of the violation and whether the fleet made an attempt to comply, and the magnitude of noncompliance. Thus, fleets that make a good faith effort to comply but that miss compliance by a small amount are unlikely to face significant fines.

Also, as discussed above, ARB is adding staff to ensure there are adequate resources to effectively enforce the regulation.

15. Comment: We are concerned about the practical enforceability of the fleet averaging as currently included in the regulation. We recognize that this is the approach used in prior regulations of heavy-duty diesel fleets. Those regulations governed more narrowly circumscribed categories, however, the sources are generally required to have registration or a permit with the ARB or a local district. The categories that do not are either municipalities or companies that contract with municipalities and are included under those reporting requirements. All of these factors enhance the enforceability of the regulations.
In the case of the off-road engines there are no permit requirements. CAPCOA is very concerned that, because the category is so broad and the engines so numerous, as a practical matter the regulation will be difficult to enforce. Especially in the case of large fleets, engines may be dispersed across a significant geographic area. The regulation, at a minimum, should require ARB or its designees to conduct field inspections of the large fleets at least once every three years, and of the medium fleets at least once every five years. Small fleets and Captive Attainment Area Fleets should be inspected at least once to verify final compliance, although some additional progress checking would also be advisable. As in the Portable Equipment regulation, fleet operators should be required to make arrangements for the fleets to be available for inspection at one or more location on one or more dates. ARB could fund this effort with a fee at the time reports are filed. We make this recommendation to increase the enforceability of the regulation as currently structured. (CAPCOA)

Agency Response: We disagree. ARB staff is committed to the implementation of the off-road rule. In an effort to keep the regulation simple and as short as possible staff opted to not put arbitrary inspection deadlines into the regulation. ARB staff will follow up on all complaints of non-compliant vehicles and will inspect fleets as often as resources allow. This approach in regards to inspection frequency is consistent with other ARB regulations and staff does not

foresee the lack of permit with the local air district hindering off-road enforcement efforts.

The regulation does contain reporting requirements for all affected fleets. Staff did not propose a fee associated with this reporting to lessen the burden on affected fleets and because we did not have the statutory authority to target the fees collected toward enforcement of the regulation. Any fees collected would have gone to the State's general fund.

11)b) Issue a Certificate of Compliance

1. Comment: Register all off-road diesel equipment. (ECCO2)
2. Comment: ARB staff should issue a certificate of reported compliance once a fleet achieves compliance with the in-use off-road diesel rule. That certificate would have to be shown in order to get any grading permit. (CAMARILLO2)

Agency Response: We agree. While staff cannot impose requirements on agencies that issue grading permits, ARB staff will work with agencies who issue such permits to educate them on the requirements of the regulation.

Also, staff added language to the regulation in the first Notice of Public Availability of Modified Text and Availability of Additional Documents which was issued on December 11, 2007, to address the certificate of reported compliance issue. This language sets up a mechanism for ARB staff to issue certificates of compliance and is cited below:

“After the initial reporting required by section 2449(g)(1) and the annual reporting and compliance certification required by section 2449 (g)(2) is received by ARB, if the reporting indicates the fleet is in compliance with the requirements of the in-use off-road diesel vehicle regulation, ARB will provide the fleet with a Certificate of Reported Compliance with the In-Use Off-road Diesel Vehicle Regulation.”

The regulation will require fleets to report their affected vehicles to ARB, label them, and update their reporting data annually. ARB staff will provide an electronic database where fleets can enter their fleet information and report if their fleet is in compliance. ARB staff will provide public access to the names of the companies who have reported that they are in compliance with the regulation. While details of each fleet and its compliance strategy would not be made public, the public would be able to search the reporting database to confirm whether companies they are considering hiring have reported and submitted the required certifications of compliance.

11)c) Give Fines and Penalties Back To Fleets for Noncompliant Equipment

- 1. Comment:** Fines and penalties collected under the regulation for non-compliance should be used to upgrade out-of-compliance equipment. (NEVADA)

Agency Response: Staff disagrees with the commenter. The comment , suggests that violators should not only be allowed to pay to pollute, but that their penalty payments should be used to correct what they should have been doing in the first place – that is bring their fleets into compliance.

The role of penalty assessments is to encourage stakeholders to mitigate the problems of pollution caused by operating older vehicles without advanced emission controls. Penalties should be set high enough that they encourage affected fleets to take proactive action, and not wait until they are caught -- which is what is meant by the phrase “paying to pollute.” Penalties would not be a deterrent in any sense of the word if penalty monies collected were effectively returned to the noncompliant fleet operator in the form of a payment to upgrade their noncomplying fleet. Fleets should not assume that any portion of a potential fine could be used to bring their fleet into compliance.

11)d) Create a Cost-Effective Process for Enforcement

- 1. Comment:** ARB needs to provide a timely and cost-effective process for finding non-compliant vehicles (NEVADA)

Agency Response: We agree. The mechanisms for systematically monitoring compliance, including inspections and reviews of reported data, are discussed in further detail below in the response to comment III-A-11e) in this FSOR.

The public will have several ways to report noncompliant vehicles and to check on whether a fleet is in compliance. ARB has established several toll free telephone lines, (866) 6-DIESEL and 1-800-END-SMOG, for the public to use. ARB staff answers these phone lines during regular business hours and if a caller is referred to voicemail they will generally have their call returned no later than the next business day. In addition, ARB's website provides a tool to report non-compliant vehicles (<http://www.arb.ca.gov/enf/complaints/complaints.htm>). Also, ARB staff is currently developing and plans to maintain a database where the public can go and view the status of a fleet and see if they are in compliance with the off-road rule.

Reports of noncompliant fleets and vehicles that are referred to the state will be followed-up quickly and efficiently. It is our goal to follow up on all complaints the same day that they are referred. However, the speed at which ARB staff will be able to follow up will vary depending on how many complaints are filed within a given time period and ARB's enforcement resources.

11)e) Regulation Too Dependent on Self Reporting/Certification

- 1. Comment:** The Regulation is too dependent on self reporting and self certification. There is really no mechanism for systematically monitoring compliance. The applicability of self-reporting is highly questionable when it comes to smaller, less sophisticated companies who may be operating the most problematic vehicles. (GC1)

Agency Response: We disagree. Although the regulation uses reporting and self certification as mechanisms to help monitor and encourage compliance, enforcement of the regulation will not be solely dependent on these mechanisms. ARB inspectors will pursue every opportunity to locate fleets that do not report and to check that the information reported is accurate. ARB staff will also be monitoring and checking the reported information to ensure it indicates compliance, and will be targeting enforcement resources toward fleets whose reported data indicates a likelihood of noncompliance.

As discussed in Chapter X of the Staff Report, ARB inspectors will have numerous opportunities to find and inspect off-road vehicles regardless of whether or not an annual report was submitted to ARB for review and regardless of whether the vehicles belong to a large or small company. For example, ARB inspectors intend to conduct audits of fleets at various facilities including, but not limited to, landfills, mines, and recycling facilities. They also intend to inspect construction sites, relying on construction permits issued by state and local agencies, including the State Water Resources Control Board. They also intend to inspect off-road vehicles they encounter being transported by truck at roadside inspection sites and California Highway Patrol operated scales and fixed inspection (safety) facilities.

Inspections may also be triggered if ARB receives reports from the public that indicate certain equipment has been observed operating with smoking exhaust, or obtains other information indicating a fleet is not in compliance with the regulation.

Also, because each vehicle will be required to have its equipment identification number (EIN) displayed prominently on the side of the vehicle, ARB inspectors in the field will be able to link the vehicle EIN to whatever action was claimed for that vehicle. With this, they will be able to tell if the vehicle does not have the proper engine installed, or is not outfitted with the retrofits claimed. Even though in most cases inspectors will likely never be able to observe an owner's entire fleet at the same time, inspectors will be able to verify the accuracy of the reported information for whatever vehicles they do encounter, and then can follow up any observed noncompliance with further inspections of the fleet. If ARB inspectors find vehicles that are subject to the regulation that are not labeled with an EIN, then that could be an immediate indication of noncompliance.

Additionally, ARB staff will provide public access to the names of the companies that have reported they are in compliance with the requirements of the regulation. While details of each fleet and its compliance strategy would not be made public, the public would be able to search the reporting database to confirm whether companies they are considering hiring have reported and submitted the required certifications of compliance. This would provide developers, government and permitting agencies, contractors and others wishing to hire construction companies a means to ensure they hire complying contractors and would allow companies to police their competitors and make sure that everyone is reporting to the ARB.

The mechanisms for enforcement described above apply equally to large and small companies. As such, staff does not believe the enforcement scheme described above will need to vary as it applies to fleets owned by small companies. The regulation's reporting requirements set forth what is expected of all companies, and no evidence was presented to indicate that small businesses would not be able to comply. While staff acknowledges that it will not be possible to catch every instance of noncompliance, staff believes the proposed enforcement structure will be effective and will ensure a high level of compliance with the regulation.

11)f) This section was intentionally left blank

11)g) Fines for Non-compliance Not Described

1. **Comment:** Fines for noncompliance are not specifically spelled out and have the potential to be very high. This is significant to me as an owner in the very risky construction business. I have to be able to evaluate the value of a potential fine as another layer of risk in my business.
(SHAWM1)
2. **Comment:** I have heard fines for the regulation would be \$5,000 to \$25,000 fine for each engine that is in violation. This would have a devastating impact. (ANDERSON1)

Agency Response: The intent of penalties in any regulatory program is to ensure that fleets comply with the regulatory requirements and to deter persons from choosing noncompliance. As such, an appropriate penalty structure in any regulation should be such that paying fees in lieu of compliance is not viewed as a "cost of doing business". Staff hopes that fleets choose to comply rather than weighing the risk and magnitude of potential fines versus the cost of compliance.

The fines associated with the regulation have been established by the Legislature and are spelled out in the Health and Safety Code. At a maximum, fines could be as high as \$10,000 per vehicle per day for willful violation of the PM portion of the regulation, and/or \$500 per vehicle per day for willful violation

of the NOx portion of the regulation. All fines in regards to non compliance will be evaluated on a case by case basis, involving consideration of a number of different factors. As stated in section 2449(k) of the regulation, among the factors that ARB enforcement will consider are the willfulness of the violation, the length of time of noncompliance, whether the fleet made an attempt to comply, and the magnitude of noncompliance. Staff believes that the penalty structure cited is reasonable when compared to the human safety and health issues associated with fleets not complying with the requirements of the regulation, and continuing to emit PM and NOx at their current levels.

The affordability of the regulation is discussed further in Chapter III-A-3 of this FSOR.

11)h) Third Party Certification Requirement

- 1. Comment:** ARB should hire a third party unbiased firm to double-check compliance reports and make sure all information is captured. (GC2) (GC5) (TA)

Agency Response: We disagree. ARB staff believes that the handling of all of the data submitted by fleets and the verification of that data can be handled in house. Staff plans to develop and implement a number of quality assurance and quality control (QA/QC) provisions when accepting and reviewing data submitted, including automatic checks as part of the electronic reporting system staff is building for the regulation, and manual checks for hard copy submittals of compliance reports. If the volume of paperwork and the QA/QC effort to review that paperwork is too great for ARB staff to handle, we may reevaluate our processing options and at that point could consider other options, one of which might be a 3rd party verification option.

11)i) Strong Enforcement

- 1. Comment:** ARB needs to develop a robust diesel regulation enforcement plan to ensure that regular and consistent enforcement, including equipment inspections, is carried out, and to seek additional funding to expand staff enforcement efforts. (UCS3) (UCS1)
- 2. Comment:** There are existing concerns about ARB enforcement staff's oversight. Other regulations under development for port trucks and private truck fleets will further strain enforcement resources. ARB must identify and secure additional resources to enforce these regulations. (UCS1)
- 3. Comment:** It is important that CARB incorporate a strong enforcement policy that will hold those companies that fall under the guidelines of the regulation to be held accountable for their actions. Enforcement by CARB is paramount for those companies that proactively improved their

equipment outside of a regulation. Strong enforcement will reward those who have complied with the terms of the regulation while holding those that have done nothing responsible for bringing their equipment into compliance before they are allowed to work on projects in California. (ECCO5)

4. **Comment:** This regulation is very burdensome on contractors. There are over 180,000 pieces of equipment out there that are going to be difficult to find. This regulation is expensive enough that companies could gain a competitive advantage by not being in compliance. The enforcement mechanism in the proposal today is not strong enough. There needs to be much stronger enforcement. (GC5)
5. **Comment:** If there's not even enforcement of the off-road rule, then we're really going to be at an economic disadvantage. Enforcement is very, very crucial. (TA2)
6. **Comment:** We have serious concerns about CARB's ability to enforce this rule. No enforcement items have been written into the ATCM. CARB has not shared with industry how they will fund the program or how many people will be hired to enforce this rule. (TA)

Agency Response: As stated in the responses earlier in Chapter III-A-11, staff is committed to strong enforcement of the regulation and understands the need for strong enforcement to provide a level playing field among affected fleets.

ARB has already added additional staff for implementation and enforcement of the off-road regulation, and anticipated adding additional staff in the upcoming fiscal year. In addition, a newly adopted law, Assembly Bill (AB) 233, will help ensure there is consistent, comprehensive, and fair enforcement of the regulation. AB233 requires ARB to submit a plan for enforcing all of the air toxic control measures (ATCMs) approved by the Board, including the in-use off-road diesel vehicle regulation, by January 1, 2009, and then to update that plan every 3 years. The plan compiled to comply with AB233 will include details on the funding of enforcement activities and the number of staff being added.

In terms of penalties for violations of the provisions of the regulation, the regulation provides for penalties as set forth in the Health and Safety Code and described in greater detail below.

7. **Comment:** What are the penalties for noncompliance? (TA)

Agency Response: In general, a person can be held strictly liable for violations of the PM portion of the regulation and subject to penalties up to \$10,000 per vehicle per day of violation (H&SC section 39674.). For violations of the NOx

portion of the regulation, a person can be held strictly liable for penalties up to \$500 per vehicle per day of violation. (H&SC section 43016.)

As specified in section 2449(k) of the regulation, any person who fails to comply with the performance requirements of this regulation, who fails to submit any information, report, or statement required by this regulation, or who knowingly submits any false statement or representation in any application, report, statement, or other document filed, maintained, or used for the purposes of compliance with this regulation may be subject to civil or criminal penalties under sections 39674, 39675, 42400, 42400.1, 42400.2, 42402, .2, and 43016 of the H&SC. Section 42400 further provides that a person may be held strictly liable for criminal penalties up to \$1000 per vehicle per day of violation or six months imprisonment for each violation.

Section 42400.1 provides that a person who negligently violates the regulation may be subject to criminal penalties of up to \$25,000 per vehicle per day of violation or nine months in jail per violation. Section 42400.2 provides that a person who knew that his vehicle(s) was causing excess emissions and failed to take corrective action may be subject to criminal penalties of up to \$40,000 per vehicle per day of violation or one year in jail per violation. Section 42402.2 provides that a person who knew that his vehicle(s) was causing excess emissions and failed to take corrective action may be subject to civil penalties of up to \$40,000 per vehicle per day. In assessing penalties, the Executive Officer will consider specific factors, including but not limited to, the willfulness of the violation, the length of time of noncompliance, whether the fleet made an attempt to comply, and the magnitude of noncompliance.

See also the response to comment III-A-11)g) in this FSOR for further explanation regarding the factors that will be weighed when determining fines for specific violations.

11)j) Do Not Require Airports to Enforce the Regulation

- 1. Comment:** Airports are not in favor of becoming the air quality enforcers for all airport users in light of the great administrative burden that would accompany the imposition of such a duty. Similarly, our limited resources are not such as to permit the rigorous policing of airport users' compliance with various air quality mandates. Airports do not want to be subject to penalties if one of their users is noncompliant. (GDB)

Agency Response: Staff agrees, and did not structure the regulation to require airports to enforce against their users or tenants, or to create a liability relative to the actions of their users or tenants. Airports, as fleet operators, are only responsible for monitoring their own fleets (i.e., fleets that they actually own). This includes making sure that all airport owned equipment is reported to the ARB, and ensuring that the appropriate PM and NOx targets are met. ARB will not require any local airport to enforce the regulation on tenant fleets that operate

on the premises of the airport. Any fines or penalties that are imposed on the tenant fleet operating within the premises of the airport will be the responsibility of the tenant, not the airport.

Since our inspectors can not be everywhere at once, though, it is imperative that ARB maintain a good working relationship with the airports to help serve as ARB's eyes and ears. If airport staff observes vehicles that appear not to be in compliance with the off-road rule, staff would appreciate a call to the ARB via one of our hotline numbers: (866) 6-DIESEL or 1-800-END-SMOG.

11)k) Idling Enforcement

- Comment:** This regulation creates another layer of bureaucracy to inspect retrofit devices. Is another crew to be created to enforce the five minute rule if the public does not? (BENTE)

Agency Response: As stated in the Chapter 12, Section G, of the TSD, enforcement of the idling portion of the regulation would be conducted similarly to enforcement of ARB's commercial vehicle and school bus idling regulations. This includes investigating idling complaints from the public reported through ARB's 1-800-END-SMOG toll-free line or online reporting system. These investigations will be headed by ARB field inspectors with authority to take further enforcement action. Also, ARB inspectors who are already inspecting fleets and verifying retrofit devices throughout California will be looking for all violations of the off-road rule including the idling requirements.

Additionally, Air District staff who notes any off-road vehicles violating the regulation's idling provisions may report such violations to ARB. Fleets that are found to be in violation of the idling requirements will be cited for non-compliance and subject to penalties and fines.

11)l) 30 Days to Apply for EIN

- Comment:** On page 58 of the Initial Statement of Reasons, staff states that, "If ARB inspectors find vehicles that are subject to the regulation that are not labeled with an EIN, then that would be an immediate indication of noncompliance." We disagree with this statement as one has 30 days to apply for an EIN pursuant to the proposed regulation. As such, it would be an indication the inspector should verify the date the vehicle was added to the fleet and that an EIN had been applied for within the 30 day period granted. (CALCIMA)

Agency Response: Staff agrees that the language in the Initial Statement of Reasons was imprecise. If ARB inspectors find vehicles that are subject to the regulation that are not labeled with an EIN, the inspectors will ask to see the bill of sale on the suspect equipment. If the vehicle was purchased or brought into the State within the last 30 days the inspectors will make a note and return once

the 30 day grace period is up. If the vehicle was purchased or brought into the State more than 30 days beforehand, it would be an immediate indication of noncompliance.

11)m) Prohibit Dumping Dirty Units in Rural Areas

- 1. Comment:** Prohibit dumping (offloading) of Tier 0 vehicles on unsuspecting rural fleets. (BCAQMD)

Agency Response: As of March 1, 2009 it will be illegal for any fleet in the state to add tier 0 vehicles, which are the oldest and dirtiest vehicles, to their fleets. Staff plans on conducting workshops and outreach events across California to inform the general public and affected fleets about the off-road rule, and in particular, this provision.

Staff acknowledges there is a possibility that some unscrupulous fleets might attempt to command more money for their older vehicles by selling them to parties that are not aware of the regulation's requirements. To minimize the occurrences of this, and create the opportunity to seek enforcement action against those who would engage in this, the regulation includes the provisions in section 2449(j) for Disclosure of Regulation Applicability. Under section 2449(j), any person selling a vehicle with an engine subject to this regulation in California must provide the following disclosure in writing to the buyer on the bill of sale:

"When operated in California, any off-road diesel vehicle may be subject to the California Air Resources Board In-Use Off-road Diesel Vehicle Regulation. It therefore could be subject to retrofit or accelerated turnover requirements to reduce emissions of air pollutants. For more information, please visit the California Air Resources Board website at

<http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm>."

Thus, ARB has the ability to take enforcement action against any party that attempts to deceive another party into buying Tier 0 vehicles by not informing them of the regulation's requirements.

12. Emission Benefits Incorrectly Estimated

12)a) Emission Benefits

- 1. Comment:** The amount of "pollution" released by this type of equipment is so small as to be almost negligible and will cost millions and millions of dollars to implement, all for very little gain. (ALLEN)
- 2. Comment:** For a minuscule gain, you would destroy thousands of lives and businesses. I request that ARB not adopt the regulation. (GE)

- 3. Comment:** The regulation is pure paperwork. It has nothing to do with actual emissions. California will achieve the same result, in a slower time frame, by doing nothing. (ECCO2)
- 4. Comment:** This will not change air pollution – be more realistic. The news reports show air pollution in Sacramento to be more than twice the level of Stockton. Does this mean there are twice as many engines running there? I don't think so. (MWS)

Agency Response: As discussed in Chapter I and II of the Staff Report and Chapter VI of the Technical Support Document, off-road diesel vehicles are a significant contributor to the State's total diesel mobile source emission inventory of PM and NOx. Off-road diesel vehicles are responsible for 24 percent of total statewide mobile source PM emissions, and 19 percent of total statewide diesel mobile source NOx emissions. Off-road diesel vehicles are responsible for an estimated 23 percent of total statewide diesel PM emissions, including emissions from stationary sources.

As discussed in the Staff Report and the Technical Support Document, without the regulation, by 2020, even though newer (and cleaner) off-road diesel vehicles will replace older vehicles, the contribution from off-road diesel engines would continue to be a major contributor to PM and NOx emissions. Despite the fact that over time emissions will decline on their own through normal turnover to newer, cleaner vehicles, the rate of decline is not enough to meet state and federal ambient air quality standards for PM2.5 and ozone, or the risk reduction goals of the Diesel Risk Reduction Plan.

Staff does not agree that the regulation is nothing more than a paperwork exercise. The paperwork elements of the regulation (i.e., the annual reporting and recordkeeping) are crucial for the regulation to be enforceable. The regulation must be enforceable for it to provide a level playing field for all fleet and to ensure fairness for those fleets that make a significant investment towards compliance. See also the response to comment III-A-11)a) of this FSOR for a discussion of the importance of reporting in making the regulation enforceable.

See also the response to comment III-A-1)i) of this FSOR for a discussion of the significance of off-road construction vehicle emissions, and the response to comment III-A-1)b) of this FSOR regarding why it is not enough to wait for the normal introduction of Tier 3 and 4 engines.

See also the responses in Chapter 2 of this FSOR for a discussion of the impact of the regulation on businesses and jobs.

- 5. Comment:** This proposed new rule will not significantly benefit overall air quality since it impacts so few pieces of equipment (agriculture is exempt). (MALDONADO1)

6. **Comment:** Information has been gathered to show that the changes will not have the desired affect on the air quality. How can you adopt a plan that will ruin the industry creating a great fiscal impact on all heavy equipment work without any significant gains? (KANAYAN)
7. **Comment:** Without a new proposal, Californians risk seeing new ineffective regulations that fail to clean the air. (BECC)

Agency Response: We disagree with the commenters, and believe the regulation will be effective and will benefit air quality greatly. While the commenter MALDONADO1 is correct to note that vehicles and equipment used for agriculture are exempt, the regulation still will affect approximately 180,000 off-road diesel vehicles in California, providing significant emission benefits from these vehicles. ARB agrees that it is important to pursue emission reductions from all existing diesel engines, and intends to address agricultural vehicles in a future rulemaking.

The tables below are excerpted from Chapter IX of the Technical Support Document. As shown in Table III-A-12)-1, staff estimates that with implementation of the regulation, diesel PM emissions will be reduced by about 4.6 tons per day (tpd) in 2015 and 5.2 tpd in 2020 relative to baseline levels. These reductions represent a 60 percent decrease in PM emissions in 2015 and a 74 percent decrease in 2020. Also, the projected PM emission rate in 2020 (1.8 tpd) will be 92 percent lower than the 2000 baseline level of 23 tpd, thereby achieving the goal of the Diesel Risk Reduction Plan of reducing diesel PM by at least 85 percent by 2020.

Table III-A-12)-1 - Statewide PM Emissions Benefits from the Proposed Regulation

Calendar Year	PM Emissions (tons per day)		Projected Reductions	
	Baseline	With the Regulation	(tons per day)	Percent from Baseline
2010	16.7	14.4	2.3	14%
2015	11.5	4.6	6.9	60%
2020	7.0	1.8	5.2	74%
2025	4.2	1.3	2.9	69%

As shown in Table III-A-12)-2, the projected NOx emission reductions from the regulation are 30 tpd and 48 tpd, for 2015 and 2020, respectively. NOx emissions will be 13 percent lower in 2015 and 32 percent lower in 2020 than they would be in the absence of the regulation.

Table III-A-12)-2 - Statewide NOx Emissions Reductions from the Proposed Regulation

Calendar Year	NOx Emissions (tons per day)		Projected Reductions	
	Baseline	With the Regulation	(tons per day)	Percent from Baseline
2010	311	298	13	4 %
2015	228	198	30	13 %
2020	151	103	48	32 %
2025	103	84	20	19 %

12)b) Incorrect Emissions / Fleet Average Calculations

- Comment:** Most fleets will retrofit 20 percent of their Tier 0 equipment in the first compliance years as this gives the most PM emissions reductions, and the PM fleet average targets are very aggressive. There is currently no incentive to turning over high NOx Tier 0 equipment first, so this rule will not contribute much to the 2015 NOx reduction goals set in the California SIP. (TA)

Agency Response: We disagree. As discussed in Chapter VI of the Staff Report and presented in Table III-A-12)-2 above, staff estimates that in 2015, the regulation will achieve a 13 percent reduction in NOx relative to the emissions levels expected in the absence of the regulation.

A fleet owner will likely choose the compliance path which meets the requirements of the regulation at the least cost while meeting his or her anticipated business needs. Due to the variety of fleet compositions and business strategies, there may be fleets that choose to retrofit their Tier 0 first and thereby avoid turning over their Tier 0 vehicles in the early years of regulation's implementation. However, other fleets may prefer to use newer, more reliable and efficient vehicles and therefore will choose to turn over to newer engines or vehicles in lieu of retrofitting. The combination of these types of compliance scenarios and other like them will provide, on average over the entire statewide fleet, the anticipated emission reductions.

12)c) Less Benefits Due to Shortage of Compliant Vehicles

- Comment:** A shortage of compliant construction equipment will result in fewer emission reductions and benefits than assumed in the AQMP. A shortage of compliant construction equipment would cause delay in providing local transportation projects, traffic congestion relief, and regionally significant transportation measures. (AGCA3) (GC2)

Agency Response: We disagree with the commenter's that there will be a shortage of compliant equipment and vehicles. As discussed in the responses in Chapter III-A-2 of the FSOR, staff anticipates adequate numbers of retrofit

devices, and vehicles (both new and used) to satisfy the increased demand due to the regulation. Therefore, staff would not anticipate any loss in emissions benefits due to a shortage of compliant vehicles.

See also the response to comment III-A-3(f)iii)1) of this FSOR regarding the regulation's impacts on infrastructure and construction projects.

12)d) Move Dirty Equipment Out of State

1. **Comment:** Moving dirtier equipment (Tier 0, Tier 1 and Tier 2) out of state does not solve the problem. It is a short term solution to an overall global problem, and implies that while the emissions go down in California, they will increase by some commensurate amount elsewhere. The improvement to air quality globally will not materialize. A lot more could be accomplished by implementation of a clean up program rather than a replacement program. (LEWISM2) (WATKINSON) (FOSTER) (MCDONALD) (BCL) (HCC) (ESCOBEDO) (CEI3) (CUSACK) (BUCKANTZ)
2. **Comment:** Staff has not prepared an analysis that shows what proportion of California's fleet is likely to be sold out of state, nor what portion of other states' fleets will be retained for a longer period as a result of this rule. Without this analysis, it is difficult to determine the extent to which staff has over estimated the expected health benefits from the proposed rule. (LEWISM2)
3. **Comment:** Sending old equipment to another state is unreasonable. (FOSTER)

Agency Response: The air quality problems facing California are, in most ways, unique to the state. No other state in the nation has as many people exposed to unhealthy air quality. California is home to seven of the ten regions in the country with the poorest air quality. California is also the only state in the nation facing significant challenges in meeting the 2014 PM2.5 federal ambient air quality standard. As such, dramatic actions are required now to protect the health and welfare of the citizens of the state.

In developing the regulation, staff understood that one effect would be to shift older vehicles out of California and attract newer, cleaner vehicles to California. This was done so such that fleets would not have to scrap otherwise useful older vehicles. LEWISM2 is correct in that we did not quantify the public health impact of the regulation in other states. However, it is important to note that such an evaluation is not required under California law, and that ARB's authorities do not extend beyond California's borders. But, in granting ARB its regulatory authorities, the California Legislature clearly intended that the purpose of developing toxic air and mobile source control measures is to improve the health and the environmental conditions affecting the people in the state of California.

In addition, under the federal Clean Air Act, California, because of the significant air quality challenges it faces, is alone among states in its ability to establish emission standards for new and in-use off-road vehicles and engines

For the following reasons, we do not agree with the commenter that the net effect of the regulation will be to simply move the problem from one location to another:

- We expect that the regulation will require installation of over 100,000 verified diesel emission control systems. These systems, such as diesel particulate filters, capture and destroy pollution before it is emitted to the air. VDECS do not simply move pollution from one geographic location to another.
- California has a dense population compared to many areas of the country. If relatively dirty vehicles are shifted out of California toward areas with lower population density, the associated pollution will affect less people and therefore, will still result in a net benefit to public health.
- California also has unique climatic and geographic conditions particularly suited to the formation of air pollution and therefore has a higher percentage of areas in the country that exceed National Ambient Air Quality Standards than any other state. Although California has only 12 percent of the country's population, 22 percent of the people living in 8-hour ozone nonattainment areas and 20 percent of people living in PM2.5 non-attainment areas live in California¹⁷. Fifteen areas throughout the state, including South Coast Air Basin, the San Joaquin Valley, the Sacramento region, San Diego, Ventura and a number of air districts downwind of the urban areas, are currently in violation of the national ozone ambient air quality standards (AAQS). In addition South Coast Air Basin and the San Joaquin Valley, do not meet the national PM 2.5 AAQS. Therefore, pollutants such as NOx that lead to the formation of ozone and fine particulate matter are of greater concern in California than in other states. If relatively dirty vehicles are shifted out of California to areas that attain the National Ambient Air Quality Standards and where the climate and atmospheric chemistry are not as conducive to formation of ozone and fine particulate matter, there will still be a net benefit to public health.

12(e) Regulation Will Not Meet Emissions Goal

4. **Comment:** In the current form, this regulation will not meet its emissions reduction goals as companies can use the CARB's exemption that allows companies to do nothing if a repower or used piece of equipment is not available. Staff overestimated what the used market for Tier 2 and higher equipment will be during the life of this regulation. The reality is that most companies will buy new equipment or use CARB's exemption that allows companies to do nothing if a repower or used piece of equipment is not

available. If many companies take this exemption from buying new, CARB will not meet its emissions goals. (TA)

5. **Comment:** In the current form, this regulation will undermine California's ability to make critical infrastructure improvements and will fail to deliver promised air quality benefits. (GC2)

Agency Response: As discussed in Attachment 3 of the Third Notice of Public Availability of Modified Text and Availability of Additional Documents, staff revised its analysis of availability of used vehicles. Although there were errors in staff's first estimate of the availability of used vehicles, the results of staff's most recent evaluation confirm that the conclusion reached in Chapter VIII of the Technical Support Document was correct in that there will be sufficient numbers of used vehicles available to fleets to comply with the regulation. As such, staff continues to believe there will be sufficient used vehicles available to fleets to meet the requirements of the regulation.

The exemption provided by the rule that commenter TA refers to is limited to specialty vehicles meeting the following criteria:

- The fleet has turned over all other vehicles first,
- No repower is available for the specialty vehicle, as demonstrated to the Executive Officer.
- A used vehicle with a cleaner engine is not available to serve a function and perform the work equivalent to that of the specialty vehicle, as demonstrated to the Executive Officer, and
- The specialty vehicle has been retrofit with highest level VDECS.

Although this exemption provides reasonable flexibility, it is very limited in applicability, and we do not believe it would result in the regulation not providing the anticipated emissions reduction benefits. As provided in the Staff Report and TSD, the regulation is expected to reduce 48 tons per day (tpd) of NOx and 5.2 tpd of PM statewide in 2020. These reductions represent a 32 percent reduction in NOx and a 74 percent reduction in PM from 2020 emissions that otherwise occur in the absence of the regulation.

Finally, ARB does not anticipate the regulation will significantly affect the ability of the construction industry to continue to build public infrastructure improvements. As discussed in Chapter XI of the Technical Support Document, the yearly costs of the regulation are significantly less than the value of the construction industry, and it is expected that the regulation will not have a significant impact on the total value of construction. Overall, most affected businesses should be able to absorb the costs of the proposed regulation with no significant adverse impacts on their profitability.

For a detailed discussion of the regulation's impact on infrastructure projects, please see the response to comment III-A-3)f)iii) of this FSOR. For a detailed

discussion on regulation's impact on new California bond funding, which relates to the infrastructure issue raised in the comment, see the response to comment III-A-3)f)iv) of this FSOR.

12)f) Focus on Both PM and NOX

- 1. Comment:** A three-year extension deadline would provide more flexibility. But it does come at a high cost. And that cost is reduction in benefits of particulate matter and nitrogen oxide emissions, and those happen throughout the state. I want to prevent a false choice between an opt-in program that would use incentive funding to get additional NOx reductions in certain areas of the state, and trading that off for direct toxic PM emission reductions that occur throughout the state and they're local pollutant -- it's a local pollutant. These are pollutants that are in communities. People who live near construction sites are affected by these. It's not just a 70-year cancer risk. There are direct short-term effects of particulate matter. And I think just, in your deliberation today, just to keep that in mind. It's a false choice the tradeoff the health benefits from an opt-in program with moneys that essentially, they're essentially Moyer moneys, they would be used to fund other projects if they weren't being used to fund these construction projects. They are not necessarily additional reductions beyond what we would get from an incentive program. I agree with the program [the SOON program], because it does require companies to use the incentive funds. And it will result in emission reductions. I just don't think the tradeoff for direct PM reductions into other parts of the state should be compromised to do that. (UCS5)

Agency Response: We agree that the regulation should not be modified to contain what the commenter calls a "three-year extension deadline," i.e., three-year targets, or having fleet average targets only every three years instead of every year. We compared the emission benefits expected to those expected from annual requirements. The results of the analysis showed that the three year targets lowered the emissions benefits of the regulation, and caused a significant increase in emissions during the first two years. This analysis is discussed in the response in section III-A-6)c)ii)7) of this FSOR.

Some commenter's at the July 26, 2007, board meeting proposed adopting the SOON program and changing the targets in the regulation to be three-year targets. The Board debated these issues and decided to adopt the SOON program but to keep annual targets in the regulation.

- 2. Comment:** We also have a concern operating in the Central Valley where ozone is a huge health risk. The diesel particulate is a chronic exposure. It has a 70-year exposure that causes issue. Ozone causes lung damage in small children immediately. We really feel that this rule sacrifices a lot of ozone reductions early on in favor of the particulate reductions, which I agree are very important, but require a longer exposure to in order to have

the kind of health impacts that people are talking about. So I would really like to see the ozone provisions of this strengthened. (TA2)

Agency Response: We believe that the regulation has maximized the reductions of both NOx and PM, while taking into account cost and technical feasibility. As stated in the Technical support Document, Chapter I, staff believes the proposed regulation represents the economic limit of what industry could bear, and any further emissions reduction requirements of either pollutant would likely require financial incentives.

The commenter claims that ozone causes immediate lung damage whereas diesel particulate is only a chronic concern. That is not correct. Diesel PM also causes acute, immediate exposure impacts, including cardiac effects and acute bronchitis. More information regarding the health effects of diesel PM is in the Technical Support Document, Chapter IV.

12)g) This section was intentionally left blank

12)h) Acrolein

12)h)i) Add Provision for Acrolein

1. **Comment:** If acrolein emissions are not mitigated through the ATCM, then they will be identified for most construction projects proceeding through the California Environmental Quality Act (CEQA) process as an unmitigated significant environment impact. This will trigger the need for an Environmental Impact Report (EIR) and mitigation.

The preparation of an EIR will be costly and time consuming. Mitigation will also be costly because each construction engine equipped with a non-catalyzed diesel particulate filter will have to be replaced by a catalyzed particulate filters at a cost of around \$10,000 apiece or more. ARB staff has identified more than 175,000 construction engines in the State. If only 10% required changing, then the cost to the construction industry may be more than \$100,000,000. In addition, this opens the door for further increased costs if CEQA is used by opponents to stop projects. A provision in the Rule should be added that requires 90% organic gas destruction so that acrolein emissions are mitigated.

Otherwise, they will be identified for most construction projects proceeding through the California Environmental Quality Act (CEQA) process as an unmitigated significant environmental impact. If there are readily available technologies that can be used to also reduce organic gas, such as a catalyzed particulate filter, then this should be considered during the rulemaking process. (MBUAPCD)

Agency Response: We disagree. ARB believes that it is sufficiently health protective to design regulations intended to reduce the exposure risk from diesel engines around the chronic risk associated with diesel PM, as the cancer risk

from diesel PM tends to be the overwhelming risk driver in most situations. Staff acknowledges that there may be some situations based on receptor proximity and meteorology where the acute noncancer Hazard Index (HI) for acrolein is above 1. However, given the site specific nature of these situations, the high level of uncertainty in acrolein emissions estimates, the less dramatic health endpoint for acrolein (eye, respiratory irritation) versus diesel particulate matter (increase in lung cancer risk, heart and lung disease, premature death, asthma attacks, and acute bronchitis), and the fact that the acrolein reference exposure level (REL) is currently being reevaluated by OEHHA, we do not believe it appropriate to design diesel PM regulations based on acrolein impacts. All the Air Toxic Control Measures that ARB has adopted to implement the Diesel Risk Reduction Plan have been designed around BACT in consideration of the diesel PM cancer risk. Further, ARB staff have cautioned local air districts about making permitting and CEQA decisions based on acrolein HIs.

In addition, the potential health risk from acrolein and any need for regulations is being assessed pursuant to Senate Bill 25 (SB25). SB25 requires the Office of Environmental Health Hazard Assessment to evaluate available information on toxic air contaminants (TACs) and develop a list of up to five TACs that may cause infants and children to be especially susceptible to illness. Acrolein is listed as one of the five TACs. SB 25 requires ARB to review and revise any existing control measures for reducing acrolein emissions and, where no control measure exists, ARB must prepare a needs assessment report and adopt any new control measure, as appropriate. Although this report is in the draft stage, preliminary emissions data show that off-road diesel equipment contribute less than seven percent of the total statewide acrolein emissions (California Emission Inventory Development and Reporting System 2003 Almanac Database Year, 2002 emissions). Upon completion of this report, any regulatory needs will be assessed and recommendations for any future measures will be made.

12)(h)ii) Acrolein Health Risk

- 1. Comment:** When diesel PM was identified as a toxic air contaminant (TAC) diesel particulate was used as a surrogate to estimate the health risk for human exposure to whole diesel exhaust (e.g. solid particulate and reactive organic compounds). During the Railway study, filters were used to collect solid particulate and the data was used to develop the diesel PM cancer potency factor. However, we do not have sufficient test data to know whether the risk is driven by exposure to solid particulate or the various air toxics that are released in gaseous form, or the relative contribution to the total risk from the organic compounds and solid particulate. The organic portion may be significant and, then, simply adding a diesel particulate filter may miss a significant portion of the health risk from exposure to whole diesel exhaust. In other words, simply reducing the solid particulate will not necessarily result in a proportional reduction in cancer risk. (MBUAPCD)

Agency Response: A primary focus of this rulemaking is to reduce the risk associated with exposure to diesel PM from off-road vehicles. This is being done in accordance with ARB's legal responsibility to reduce the health impacts of exposure to toxic air contaminants (TACs). As the commenter notes, when diesel PM was identified as a TAC by the Board in 1998, all diesel PM (and not its individual components) was used as a surrogate. Therefore, any reductions in diesel PM emissions provide a corresponding decrease in risk from exposure to diesel PM. Since this rulemaking did not modify the Board's findings in regards to its identification of diesel PM as a TAC, this is not the appropriate forum to address whether there certain individual organic compounds found in diesel exhaust which would be more appropriate to control and that would provide a greater decrease in cancer risk relative to diesel PM,

For more detail regarding how the health risk for Acrolein will be addressed, please see the response to comment III-A-12h) of this FSOR.

13. Comments in Support of the Regulation

The following Reference Codes pertain to comments that were wholly in support of the regulation. If a comment was partially in support of the regulation but also suggested changes to the regulation, it is not included below, but is responded to in the agency responses.

Reference Code
BEHMERWOHLD
ALA1
ALA2
ALA3
ALA4
ALA5
ALA6
ALA7
ANAIR1
BOLANOS
BREATHE
BREATHE2
BREATHE3
CALCIMA
CAN
CAN2
CATF1
CATF2
CSU-FRESNO
CVAQC
DOT

Reference Code
EARL
ENVDEF
ENVDEF2
EXCEL1
EXCEL2
EXCEL3
EXCEL4
FEUSNER
GOLD
GREINER
HILL
INDUNI
JMC
JMC2
KEHOE
KELTER
KOPET
KUEHL
MECA
NRDC
OAKLANDENV
R&L
RAMP
RATNER
RCRC2
ROCHE
RORICK
ROSE
ROSE10
ROSE11
ROSE2
ROSE3
ROSE4
ROSE5
ROSE6
ROSE7
ROSE8
ROSE9
RUMON
SALDANO
SIERRACLUB1
SIERRACLUB2
SIMITIAN
SJVAPCD

Reference Code
STEIN
THIBODEAU
UCS1
UCS3
UCS4
UCS5
VANHOORN
VEEN
WOOD

In total, individuals sent ARB over 3,000 support letters urging adoption of the regulation. In addition to the comments referenced individually above, we received several batches of form letters in support of the regulation. A summary of the sets of support letters received follows:

- INDUNI – 757 additional form letters received;
- THIBODEAU – 177 additional form letters received;
- FEUSNER – 465 additional form letters received;
- GOLD – 1,582 additional form letters received; and
- BEHMERWOHLD – 60 additional form letters received.

14. Comments Not Pertinent to the Regulation

The following Reference Codes pertain to comments that were not pertinent to the regulation:

Reference Code
BOSWELL
BOWMAN
CALTRANS
CHC
CSE
DAVISR
DAVISS
HUSS
JUNGREIS
SHC1
VEEN
WIEDEMAN

15. Fleet Average Calculator

15)a) Include Hours of Operation

1. **Comment:** The fleet average calculator should include the ability to input hours of operation and use this in the calculation of the results. This is an

option available in the regulation, and CARB staff has said they were going to include it in the calculator. (ECCO1, CIAQC7)

Agency Response: ARB staff agrees, and believes adding this function would improve the overall robustness of the calculator. However, as noted above, the calculator is not required to determine compliance with the regulation. Despite this, staff is researching the best method of implementing the equipment hours of operation into the calculator, and will continue to update the calculator online as upgraded versions are developed.

15(b) Has Errors

1. **Comment:** I have real concerns as to the accuracy of the worksheet in its entirety. I loaded our fleet inventory into the April 2007, Version 1.1, and found some typographical errors that I believe should be corrected to reflect a more professional working document. Although the misspelling of words does not constitute any immediate problem that I can see, it does raise my suspicions about the accuracy of the worksheet calculator. If misspelled words are present in this CARB issued document, is it possible that the calculator may have errors as well. (ECCO1)
2. **Comment:** The method of calculation is not defined - ARB has not described the calculation comparison method in the regulation. ARB has demonstrated a calculation method in its Fleet Calculator that is inconsistent between NOx and PM and is incorrect for NOx. It is important to define an exact approach for the comparison of fleet average target rates. The approach should be unbiased to the greatest extent possible and should correctly display NOx targets in the same digit of precision as the regulation. In the off-road regulation, the precision of the NOx emission targets is one decimal place, and the precision of the particulate emissions targets is two decimal places. The precision of the average emission factor must be in agreement with the target in order for a legitimate comparison to be made. Using test fleet data entered into the program, it was noted that the calculator arbitrarily increased the precision of the NOx targets by one decimal; in both the listed NOx targets and the results obtained from the test fleet information put into the Fleet average calculator. The off-road regulation lists the NOx target for 2020 as 3.5, while the calculator listed the target as 3.50, and calculated the results as 3.52. The precision of the published target means that the target could be as large as 3.55 as this value would be rounded down to 3.5. There is no reason for an added digit of precision to be zero, and the proper construct would be to round the NOx result to one digit before comparison, as the ARB calculator correctly rounds PM emission results. (ARA2)
3. **Comment:** I would recommend that the development and roll-out process be reviewed and changed to include better quality control. You can multiply the number of hours I wasted trying to use the tool by thousands

when the public is forced to use it. Time is money in the private sector.
(SUKUT1)

Agency Response: The initial version of the fleet average calculator was developed and released as quickly as possible to provide a tool to fleet owners to assist in their understanding of the rule, and to allow them to anticipate the impact of the regulation on their fleets. In response to commenter ECCO1, we regret any typographical errors in the calculator documentation. However, while the release of the calculator could have been delayed until all revisions, grammar and formatting were carefully checked, ARB staff believes the earliest possible release of the working calculator provided the greatest benefit to the broadest range of fleet owners.

The calculator has, as mentioned in previous responses, undergone numerous revisions and clarifications since the initial version, and industry feedback was invaluable in this process. Among the revisions, the calculator now correctly displays NOx targets in the same digit of precision as the regulation. The NOx results are also rounded to the same decimal place as the NOx target prior to comparison. The rounding procedures used by the calculator are the same used in determining compliance with the regulation.

As the calculator continues to be improved and developed, it will be continuously checked, and any updates will be thoroughly reviewed prior to their release. The calculator will be constantly revised based on the feedback from fleet owners who opt to utilize this tool, in order to better serve the needs of affected industry. Use of the calculator is by no means mandatory, and any fleet owner who feels it is not an asset is encouraged to employ any method of compliance planning that they find more efficient or effective, including utilizing tools they develop themselves, or that are developed by private third parties.

15)c) Not Adequate for Large Fleets in Compliance Planning

- 1. Comment:** The CARB fleet average calculator spreadsheet has helped us determine what our current fleet average and distribution is and what CARB fleet average targets are for our company, but does not provide any other service for us. The spreadsheet has errors, and does not help a company with more than a few pieces of equipment determine different compliance paths it could take. We are a large company with a staff devoted to environmental compliance and we do not know how to best CARB fleet averages. CARB needs to provide some type of modeling tool to help companies determine how different compliance paths would affect both their costs and air quality. (TA)
- 2. Comment:** After reviewing the spreadsheet, I needed to expand it to take the number of engines in our company's fleet. There were no explanations on how to do this and I wasted time attempting to make necessary changes. I was told by the developer there would be update

instructions published. However, almost a week later, I have seen nothing. (SUKUT1)

Agency Response: The initial version of the fleet average calculator was limited in size so that it could be downloaded in a reasonable amount of time and used by fleet owners with slow internet connections. This size restriction made entering a large number of vehicles into the spreadsheet a relatively complicated procedure. This issue has been resolved, and the calculator's capacity is now increased. For fleets that need to enter more vehicles than provided for in the updated spreadsheet, staff added clear instructions and simplified the process. Large fleets should notice significant improvements in utilizing the most recent version of the calculator as compared to earlier versions, and CARB staff is monitoring feedback should further improvements be needed to accommodate fleets with a large number of vehicles.

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15)d) Calculator Not Available in Time

1. **Comment:** The fleet average calculators were released just a couple weeks prior to the Board meeting on the regulation, and 10 days prior to the Board meeting, most construction companies did not know what the effects of the pending rule would cost in terms of updating their fleets. The complexity of the rule necessitates the use of a tool like this. However, when it is released just a couple of weeks prior to the Board's meeting, construction industry fleet owners are not able to generate data from which they can make informed decisions. This is another reason why more time needs to be allowed between the rollout of a tool like this and the Board's decision. The time crunch is simply unacceptable for most in the construction industry to react. (SUKUT1)

Agency Response: Staff recognizes that the earlier planning tools, such as the fleet average calculator, are made available to fleet owners, the benefit of these tools increases. As such, the staff has endeavored to assist fleet owners as early as possible to provide sufficient time for compliance planning. Throughout the regulatory development process, we provided and updated the calculator as quickly as available resources would allow. However, the fleet average calculator is not required to determine compliance with the regulation. As discussed further below, use of the calculator is not mandatory, and fleet owners are always free to develop their own tools for planning compliance, as all of the equations upon which the fleet average calculator are based are contained in the language of the regulation. It is also important to note that, as a rough estimate of maximum possible compliance costs, a fleet could estimate the cost of compliance with the BACT provisions in the regulation (8-10 percent annual turnover and 20 percent retrofit). By taking this approach, the fleet could be assured, because the regulation never requires a fleet do more than this, that its costs would never exceed this amount.

Additionally, the calculator was not necessary in order for the Board to make a decision regarding the regulation's effect on industry, as the economic impact analysis was completed prior to the development of the calculator. At its core, the fleet average calculator is a tool intended solely to aid fleet owners, and was not used by staff to estimate the costs or emissions benefits of the regulation

15)e) Continually Update the Calculator

- 1. Comment:** I have now loaded our company fleet into at least three different, ARB issued, fleet worksheets. About the time I think I am working on the most recent version of the calculator, a new one appears. Several days ago I received an e-mail that stated the worksheet was once again updated. I loaded information for over 700 machines into the worksheet only to find that nothing really had changed and that the update that was supposed to be included in the e-mail was nothing more than the worksheet I already had. (ECCO1)
- 2. Comment:** ARB should continue to update its on-line calculator tool and ensure the regulated entities can use this calculator to prepare and submit fleet wide emissions information. (LACITY)

Agency Response: As noted previously, ARB staff plan to develop and release continual improvements to the fleet average calculator to meet the needs of fleet owners and reflect any modifications to the regulation. When the calculator is updated, the date of modification is noted on the website, next to the download link, to ensure that fleet owners do not mistakenly reuse the same worksheet. Staff envisions updates to the calculator to include new features designed to simplify and improve the tool. However at this time there are no plans to allow fleets to submit emission information using the calculator. The calculator is a resource designed for planning compliance strategies. The submission of data, as required under the regulation, will be handled via a separate on-line reporting tool/database, which will also be provided by ARB. (Fleets will also have the option of reporting their data via hardcopy.) ARB staff also plans, in consultation with stakeholders, to develop additional electronic compliance planning tools during implementation of the regulation.

15)f) Calculator Not for Compliance Purposes

- 1. Comment:** The calculator states that it is "not for compliance purposes" yet provides the only way for most companies to determine their compliance. (TA)

Agency Response: The staff understands that the calculator will be used by many fleets to determine compliance strategies. However the clarification that it is "not for compliance purposes" is necessary to ensure than fleet owners do not

erroneously believe that using the calculator may remove the requirement to comply with the annual reporting requirements in the regulation.

15)g) Accessibility of the Calculator

1. **Comment:** ARB staff has attempted to assist fleet owners to measure their fleets with an Excel based spreadsheet tool referred to as the fleet average calculator. More than once there have been announcements that the calculator was available, and there was no link to locate it. A search of the web site did not help, and I found myself spending time trying to find it. It simply was not available for public use. (SUKUT1)

Agency Response: ARB staff agrees that the fleet average calculator should be easily accessible, and recognizes that, although we did our best to make the calculator available to fleets and to provide one-on-one assistance in its use to any fleets that requested it, early versions that were released during the regulatory development process may not have been as easy to locate as desired by affected fleets. The calculator, developed to assist fleet owners in determining which actions would allow them to meet compliance requirements for the off-road regulation, was designed with the assumption that a wide variety of fleet owners would utilize this tool. Keeping this philosophy in mind, ARB staff continues to be committed to ensuring that the calculator is available, accessible and sufficiently easy to understand and operate for all fleet owners. In addition, we plan to provide continual assistance to fleet owners in locating and using this valuable resource.

The fleet average calculator is located on the ARB website for the Off-Road Diesel Vehicle Regulation (<http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm>), and may also be found by searching the ARB website for “fleet average calculators” or “Off Road Diesel”. As improvements to the calculator are developed, ARB staff will continue to supply updated information about this tool at workshops, online, and at other opportunities for public outreach and education regarding the off-road regulation.

16. Regulatory Procedure/Process

16)a) All Documents Pertinent to Rulemaking Not Made Public

1. **Comment:** The comment period needs to be restarted. The public is entitled to review all documents involved in development of the rule. Staff has not posted reports and the model used to establish fleet compliance (the Statewide Off-road Regulatory Cost Benefit Model). This is a violation of the California Environmental Quality Act (CEQA). Staff has not been forthcoming with their data and models. (CIAQC7) (M3CON).

Agency Response: We disagree. The data, methodology, and models used during development of the regulation were shared with the public and

stakeholders, and staff documented them thoroughly in the Staff Report and Technical Support Document.

During the 45-day public comment period, commenters CIAQ7 and M3CON asked staff to provide the Statewide Off-Road Regulatory Cost Benefit Model (the model). The model is a visual basic module that runs within an Access database, utilizing Access queries. The model estimates the cost of compliance and the NOx and PM emission reductions expected from the regulation. Appendix H to the Technical Support Document, which was released in April 2007 and which is 72 pages long, describes all equations and data upon which the model is based. It describes how the model calculates model fleet compliance, costs, and emission reductions within the model. Appendix H contained sufficient information for any interested stakeholder to reproduce the results of the model. In addition, all results of the model that the Board used to base its decision on were presented in the Staff Report and Technical Support Document.

However, to be responsive to stakeholders' interest in the model, staff posted the model to the ARB website on May 17, 2007, which was over two months prior to the July 26, 2007, meeting when the regulation was approved by the Board.

Staff is not clear on commenters' contention that ARB violated CEQA. ARB has fully complied with CEQA requirements, as explained in Chapter III-A-19 of this FSOR

16)b) This section was intentionally left blank

16)c) Not Enough Stakeholder Involvement

- 1. Comment:** There was not typical stakeholder involvement in this regulatory process. If there had been, there would not be such consistent opposition expressed. What should take place:

A true stakeholder group should be convened. This group would then roll up their sleeves, and come up with workable solutions.

The issues are important enough that monthly meetings could be held, and real progress could be made in a short period of time.

A consensus would then be developed. Consensus is not unanimity, but it is an agreement between most of the major stakeholders.

A revised regulation would then be proposed. That revised regulation would be accepted, enforceable, and fair. (CALPASC1)

- 2. Comment:** From my perspective, it seems that the new regulation was drawn up without considering all the stakeholders' perspectives. (EUCA3) (JANSSON)

3. Comment: However, it appears that CARB staff has little knowledge of what it takes to "Get the Job Done" in the Construction Industry. Would you want a sewer contractor creating a regulation for the health Care Industry? NO! Simply put, a ruling cannot be crafted properly by individuals whom have little knowledge of an industry that are trying to regulate. The ECA believes that creating a task force comprised of CARB and industry members would reach mutually agreeable goals towards air quality without demolishing the Construction Industry. (ECA)

Agency Response: As discussed in Chapter IX of the Staff Report and Chapter III of the Technical Support Document, staff held 13 public workshops and 8 workgroup meetings over the last two and a half years (since November 2004) to discuss development of the proposed regulation. These were held in various locations throughout the State to allow stakeholders to participate in person or by webcast. In addition, staff met with individual stakeholders, and contacted various industries, associations, individual businesses, and other organizations to inform them of the proposed regulation. Staff also did two major mailings to licensed contractors in the state to keep them informed about the proposed regulation along with surveys and upcoming public meeting. Over 370,000 mailings were sent to over 4,000 landfills, recycling facilities, mining facilities, small airports, rental companies, construction companies, to notify them about the development of the proposed regulation and to encourage participation.

We believe the regulation has accommodated the concerns of all parties to the extent possible while addressing the urgent need for significant emission reductions.

Please see also the response in Chapter III-A-3)d)iv) of this FSOR for a discussion of staff's understanding of affected industries.

16)d) Statewide Fleet Status Review

- 1. Comment:** Staff should conduct a review of the state wide fleet status in 2017. The compliance review should take into consideration the availability of Tier 4 technology and fleet penetration/integration, and should trigger compliance time extensions if either of these items is found deficient. (CBCC2)
- 2. Comment:** Look back provisions such as you're looking toward adopting in this rule are very helpful in order to gauge progress over time. The look back provisions in our solid waste rule have been helpful. The most current solid waste rule review has been helpful. (CFC).

Agency Response: Staff agrees that status reports to the Board during regulation implementation will be helpful. In fact, in the resolution adopted on July 26, 2007, the Board directed staff to provide status reports as follows:

By January 2009, provide a technology update report on the status of diesel emission control strategies that have been verified by ARB and are available for installation to comply with the March 1, 2010 compliance date; the report shall include an update on the number of devices that have been verified, the cost of those devices, and information on the ARB/South Coast Air Quality Management District/Mobile Source Air Pollution Reduction Review Committee Off-Road Diesel Retrofit Showcase;

By December 2010, provide a status report on compliance with and enforcement of the March 1, 2010, compliance date for large fleets; the report shall include an analysis of the effect of the flexibility provisions of the regulations and the regulation's economic impacts; and

By December 2013 and 2017, provide updates on compliance and enforcement that respectively cover the period March 1, 2010, through March 1, 2013, and March 1, 2013, through March 1, 2017, and updates on engine technology, including engine and vehicle manufacturer progress in having compliant Tier 4 engines and vehicles in the California market in the later years of regulatory implementation.

Staff plans to comply with the Board's direction and provide these status reports at the times specified.

16(e) Form an ORD Advisory Group

- 1. Comment:** The other thing I plead and ask is cooperation. As we go on with our businesses, large and small, that we are allowed to help you design these regulations, draft, revise these regulations, as we go in, under the years to come to try to clean up the air here in this state, because that is what has worked with my company and others. (MATICH)
- 2. Comment:** The problem is our association only represents 350 out of the 234,000 contractors in California. We ask the ARB to please invite us into the implementation process. We can help. (SCCA5)

Agency Response: We agree that cooperation between staff and the stakeholders is very essential during the development and implementation stages of the regulation. During the development process, various outreach efforts were made to notify affected stakeholders of the regulation and to give them opportunities to participate in the regulatory development process. Thirteen public workshops and eight workgroup meetings were held in the last two and a half years throughout the state in an attempt to reach out to the affected community. Staff have also met with individual stakeholders and contacted various industries, associations, individual businesses, and other organizations to inform them of the proposed regulation. In addition, staff also contacted rental companies, public utilities, individual construction companies, and all of the major airports in California (Sacramento, San Francisco, Oakland, San Jose, Burbank,

Ontario, Los Angeles, John Wayne, Long Beach, and San Diego) to notify them about the development of the proposed regulation and to encourage their participation.

Following the approval for adoption of the in-use off-road diesel vehicle regulation on July 26, 2007, staff is now beginning its efforts to implement the regulation. ARB staff is committed to the successful implementation of the regulation, and believes that success begins by working cooperatively with stakeholders throughout the implementation process. Staff is looking at forming an off-road implementation advisory group (ORIAG) which will be an informal committee established by staff to assist with the implementation of the regulation. ORIAG will help fine tune our outreach, training, and implementation strategies and materials and help make staff more aware of the opinions and needs of the affected stakeholders. Staff has invited interested parties to apply for membership in ORIAG, and more information is available at:
<http://www.arb.ca.gov/msprog/ordiesel/documents/documents.htm>

16)f) Amendments to Regulation in Future

- 1. Comment:** The most significant objections to the required retrofit devices are that the regulation makes no provision for likely future changes in fuels and equipment and there is no provision for revisiting this regulation. (GLATKY)

Agency Response: At the July 26, 2007, Board hearing, the Board in Resolution 07-19, directed staff to provide periodic status reports (beginning in 2009) on technology, enforcement, and compliance with the regulation. At these scheduled updates, staff may recommend future changes to the regulation to assist implementation and compliance with the regulation. A more detailed discussion on these status reports is located in the response in Chapter III-A-16)d) of this FSOR. Additionally, at its discretion, the Board may convene additional hearings, beyond those scheduled in Resolution 07-19 to review the regulation and make any changes that it deems necessary.

- 2. Comment:** Require staff to report to the Board on a semi annual basis status of compliance and implementation issues. It is essential that the regulation is reviewed periodically as it is an evolving regulation. (GLATKY)

Agency Response: This comment is addressed in section III-A-6)k)xix) of this FSOR which addresses “look back” to gauge the progress of the regulation. The Board has directed staff to provide reports to the Board to assess the progress in implementation.

16(g) Regulations Not Modified Due to Stakeholder Input

- 1. Comment:** ARB does not listen or work with the people who make the state what it is. (FREETHY)
- 2. Comment:** I expect that these comments will fall on deaf ears. I believe that the outcome of this process is already determined. The industry has worked for years with CARB staff and repeatedly presented reasonable solutions that will attain the required goals in the end. There has been little or no reaction by CARB staff to industry concerns and in fact over time the regulation has become more restrictive, despite feedback from our industry. (SHAWM1)
- 3. Comment:** We are not being heard now. I can only tell you the entire experience of working with staff has been frustrating and a waste of time and money. Most of them talk, but they have a hard time listening to our suggestions. I have heard the phrase "we will look into that" many times. None of staff have been in business or own diesel equipment. How could they know the finer details of our industry? (DER7)
- 4. Comment:** You should know I have been at two or more ARB hearings/workshops and feel that we were ignored by most of the CARB people there. As proof you can see the regulation has taken little of our needs into consideration. Please reconsider these regulations. (AWD)
- 5. Comment:** Despite my efforts and the efforts of many private citizens and local business men and women like me, it would appear that passage of this regulation is moving forward. (LTE)

Agency Response: Throughout the development of the regulation, ARB staff held over a dozen public workshops and work groups dating back to November 2004; dozens of private meetings with affected fleets were also held during this period. A complete list of meetings held between November 2004 and April 2007 is shown in Chapter III of the Staff Report. During these meetings, ARB staff solicited input from the affected industries on the proposed regulatory language. The Board and staff listened to and incorporated some of the ideas from stakeholders; listed below are just a few modifications made based on stakeholder input:

- The idea to incorporate the fleet average provisions;
- Allowing PM BACT retrofit credit for the retirement of Tier 0 machines in a fleet with decreasing horsepower;
- Allowing all municipal fleets in low-population rural counties to be counted as small fleets;
- Raising the small fleet threshold to 2,500 horsepower;
- Removing the small business requirement from the small fleet definition;
- Including Santa Barbara county as an attainment area; and

- Excluding Job Corps non-profit training centers from the performance requirements.

Additionally, staff did consider many alternatives during the development of this regulation. Please see the response in Chapter III-A-8)a) of this FSOR for a discussion of the alternatives considered by staff during the development of this regulation.

For a discussion on ARB's understanding of the affected industries, please see the response in Chapter III-A-3)d)ii) of this FSOR.

16)h) Inadequate Outreach

1. **Comment:** It is our understanding that CARB has conducted its public outreach program to inform potentially impacted businesses of the regulation throughout the development of this regulation. However, the district received information from some of our local businesses that they were unaware of the economic impacts this regulation could have upon their businesses. (NSAQMD)
2. **Comment:** The CARB staff has not done a good job in notifying the industry. I got notification from CIFAC two months before I saw a notice from CARB. Most contractors are still confused about what is going on. As a result what feedback you have received is only from a small percentage of the industry. (LAMON)
3. **Comment:** More public outreach is needed so that those affected are aware of the requirements, compliance timelines, and the potential grant and funding opportunities. (BCAQMD) (SVBAPCC)
4. **Comment:** Eighty-five percent of all construction companies are small businesses with fewer than 20 employees. Only 30 percent of all construction companies belong to industry associations, and we cannot reach them all. There are many thousands of companies, large and small, that will be affected by the regulations but don't yet even know they are coming. (AGCA6)
5. **Comment:** I ask ARB to communicate with us. Communication with our people, particularly the voters in this state with, not just construction industry but all business, there's a lack of communication on what's happening today. And I admit it was only until the last 90 days that I became aware and alarmed of what was happening. That's my fault. But with the entities that I talked to and other state agencies are in the dark as well on what is happening today with this Board. And I'm talking our Transportation Commission, even the License Board and other entities are asking me, calling me up, what do you take of it? What is your opinion? Would you be willing to express that to the Board? And I wondering, well,

we have a lack and a breakdown in communication on what's going on here in this great state. (MATICH)

Agency Response: Staff conducted many outreach efforts to notify affected stakeholders of the regulation and to give them opportunities to participate in the regulatory development process. These efforts are described in Chapter III, Section B of the Technical Support Document available at:

<http://www.arb.ca.gov/regact/2007/ordiesl07/ordiesl07.htm>

Thirteen public workshops and eight workgroup meetings were held throughout the state. Staff have also met with individual stakeholders and contacted various industries, associations, individual businesses, and other organizations to inform them of the proposed regulation. Rental companies, public utilities, individual construction companies, and all of the major airports in California (Sacramento, San Francisco, Oakland, San Jose, Burbank, Ontario, Los Angeles, John Wayne, Long Beach, and San Diego) were contacted to notify them about the development of the regulation and to encourage their participation.

In February 2007, ARB sent a postcard to over 290,000 licensed contractors using an expanded list from the CSLB that covered all licensed contractors in the state regardless of the license classification. The list included contractors with active or inactive licenses and those in arbitration. The postcard informed them of the proposed regulation and invited them to participate in upcoming public workshops.

Following the Board's approval to adopt the regulation, ARB staff is now beginning its efforts to implement the regulation. Staff is in the process of developing outreach, education and training materials, and reporting and compliance planning tools. During the workshop process prior to the regulation's approval, several industry stakeholders suggested that ARB should form an advisory group to assist staff with implementation. Staff would like to form an off-road implementation advisory group (ORIAG), which will be an informal committee established by staff to assist it in implementing the regulation. Staff is looking for the ORIAG to help fine tune our outreach, training, and implementation strategies and materials, and help make staff more aware of the needs and opinions of affected stakeholders. Staff has invited interested parties to apply for membership in ORIAG, and more information is available at:

<http://www.arb.ca.gov/msprog/ordiesel/documents/documents.htm>

6. **Comment:** Compared to the February 2007 version, certain NOx emission targets, especially the 25 to 49 and 50 to 74 horsepower categories have been significantly tightened. Since this is a significant change in the regulation, it should have been highlighted instead of burying the change in the newest version of the regulatory language available only in the Staff Report. This is not in the spirit of the outreach efforts of Staff and heightens the concern of participants regarding the

continued lack of transparency of the process, particularly with regard to NOx. (ARA2)

Agency Response: It was not our intent to bury in or any way hide the changes to the NOx targets presented in the April 2007 Staff Report. However, due to the complexity of the regulation, it would have been difficult for ARB staff to highlight all changes to the February 2007 regulatory language in the Staff Report document. We regret that these changes were hard to distinguish from other modifications in the regulatory language; however, we feel that the 45-day comment period given after the release of the Staff Report was ample time for the affected industries to review the revisions to the regulation.

16)j) Horsepower Cutoff

- Comment:** We received your recent card. The previous card stated over 50 hp and now it says over 25 hp. (MWS)

Agency Response: There are a number of ARB programs which target off-road engines and equipment. In 2007, two separate divisions within ARB sent stakeholders postcards addressing existing and proposed regulations affecting off-road engines. The former discussed a regulation which regulates portable equipment, and the later was the in-use off-road diesel vehicle regulation. Both divisions sent these post cards to the same mailing list.

For clarification, the portable equipment regulation applies to engines equal to or greater than 50 hp, while the in-use off-road diesel vehicle regulation is applicable to vehicles 25 hp or greater. We apologize if this confused stakeholders.

16)l) Makeup of Board

- Comment:** Why is the Board comprised of ARB employees? Why do you not have contractors and equipment manufacturers on the Board? (RRPI1)

Agency Response: The Air Resources Board (Board) consists of 11 members appointed by the Governor with the consent of the Senate. All members serve "at the pleasure" of the Governor. The Board members serve part time, except the Chairperson, who serves full time. Members must meet qualifications specified in the law. Five members must be chosen from the boards of local air quality management districts:

One each from the

- San Diego Air Pollution Control District
- San Francisco Bay Area Air Quality Management District
- San Joaquin Valley Unified Air Pollution Control District

- South Coast Air Quality Management District (Greater Los Angeles Region)
- and one from any other district

Three other members fill specific categories:

- one must have expertise in automotive engineering or closely related field
- one must have expertise in science, agriculture, or law
- one must be a physician and surgeon, or health effects expert
- one of the three remaining members must have expertise in air pollution control or must meet the qualifications of one of the three categories mentioned above.

The remaining two members are public members.

The governor appoints a fulltime Chairperson to the Board from among its members.

Each Board member contributes her/his expertise and talent to the ARB's programs. Such activities include: giving speeches, serving on committees of the Board and other governmental committees such as the ARB Agricultural Advisory Committee, Southern California Association of Governments, San Joaquin Valley Air Quality Study Committee, and participating in various ARB workshops. For more information visit ARB web site at:

<http://www.arb.ca.gov/board/aboutus.htm>

16)m) Develop Specific Guidelines for Local Government

1. **Comment:** ARB should develop guidelines for local governments and air districts to assist them in protecting sensitive populations from diesel emissions at or near construction sites and preventing toxic hot spots. (UCS3)

Agency Response: We agree with the need to continue to work with stakeholders, and anticipate working closely with fleet owners, engine, retrofit, and vehicle manufacturers and dealers, as well as local governments, local air districts, and other members of the public during implementation of the regulation. However, we do not believe that developing the guidelines requested by the commenter is essential to implementation of this regulation, or to further protect sensitive populations.

Please see the response in Chapter III-A-6)c)vi)6) of this FSOR for a discussion of why the regulation does not include special provisions adding protections for sensitive receptors.

16)n) Pace of Rulemaking

1. **Comment:** I believe this effort proposed by the ARB is irrational and is more or less a quick fix for a much larger problem. Instead of thrusting

these sparsely thought out regulations upon us, there needs to be a contemplative solution that eases the loss to the businesses as well as addressing much larger problems. (MCNALLY)

2. **Comment:** Confusion over the final version of the rule is already having an impact on new equipment sales. Fleet owners are waiting to see what the requirements are before investing in units that they will have to replace again within the next few years. This is slowing the pace of industry emission reductions. (SCCA3)

Agency Response: As discussed in Chapter IX of the Staff Report and Chapter III of the Technical Support Document, staff held 13 public workshops and 8 workgroup meetings over the last two and a half years (since November 2004) to consider and develop the proposed regulation. These were held in various locations throughout the State to allow stakeholders to participate in person or by webcast. In addition, staff met with individual stakeholders, and contacted various industries, associations, individual businesses, and other organizations to inform them of the proposed regulation. Staff also did two major mailings to licensed contractors in the state to keep them informed about the proposed regulation along with surveys and upcoming public meeting. Over 370,000 mailings were sent to over 4,000 landfills, recycling facilities, mining facilities, small airports, rental companies, and construction companies, to notify them about the development of the proposed regulation and to encourage participation.

We do not agree that the regulation is irrational or was “sparsely thought out”; indeed, staff considered it carefully and explored many alternatives during the three years of its development. We believe the final regulation has been fully vetted and attempts to balance the needs of the state and the various, and often conflicting, interests of stakeholders. Please see the responses in Chapter III-A-8 of this FSOR for further description of the alternatives considered.

The commenter SCCA3 suggests that confusion over the final version of the rule is slowing the sales of new vehicles. Although we acknowledge that some fleets may have delayed decisions on the purchase of new off-road vehicles until the regulation became final, we believe that the current slowdown in the economy may be playing a significant role in new vehicle sales. Regardless, now that the rule is finalized, ARB intends to conduct significant outreach to assist fleet owners in implementing and complying with the regulation.

Please see the response in Chapter III-A-16(p) of this FSOR for more discussion of outreach issues.

16)o) Data Ignored

1. **Comment:** Staff, in their eagerness to implement the regulation, chose to ignore or marginalize the data that Camarillo provided. (Camarillo6)

Agency Response: We are grateful to CAMARILLO6 and other stakeholders for all the data that they provided during the development of the regulation, but do not believe we ignored or marginalized the data they shared with us. Indeed, the commenter was one of the few fleets that opened their financial records to us, and shared all of their fleet data. Staff did a detailed analysis of potential compliance paths and costs for Camarillo and an analysis of how the commenter could handle those costs in the context of its revenues and profits. The analysis results were shared with the commenter during a meeting at their headquarters on June 20, 2007, and subsequent results with a company representative via email. The analysis of the commenter's data and other similar fleet analyses helped with staff's cash flow analysis that was presented to the public at a July 16, 2007, workgroup meeting, and at the July 26, 2007, Board meeting.

16)p) Do Big Outreach Effort after Adoption

1. **Comment:** ARB should develop an outreach program and make sure that the stakeholders are informed. Outreach and education are important components of enforcement. Ensure that adequate resources are available for outreach to the regulated entities. CARB staff needs to take industry outreach as a serious responsibility and work with the industry to be sure that every stakeholder that will be affected by these regulations (contractors, equipment owners and dealers) is informed of the pending regulation and has the opportunity to be a part of the process. (USN) (NWS) (SHAWM1) (UCS1) (ENVDEF3)
2. **Comment:** CARB staff should place a card with the Department of Motor Vehicles (DMV) renewal for a one year period which will outline the off-road ATCM. ARB should guarantee that the outreach problems that occurred in the Portable Equipment Registration Program are not repeated for this regulation. (NWS).
3. **Comment:** The trade associations, the associated general contractors, and such will play an important role in linking ARB to their members and help their members in complying with the regulation. (ENVDEF3)

Agency Response: We agree that outreach is extremely important, and we are planning a significant and coordinated effort to reach all those who will be affected by the regulation and to provide assistance to any fleet owners who want it.

ARB has formed a new section with six staff members to take the lead on implementation of the regulation, and once the rulemaking package for the regulation is complete, the top priority for that section will be to conduct outreach and training related to the regulation. The new section will develop outreach, education and training materials, and reporting and compliance tools.

One of the suggestions made during the workshops prior to the regulation's approval by the Board was to form an advisory group. We agree with this suggestion and are forming an off-road implementation advisory group (ORIAG). ORIAG is intended to represent a broad and diverse group of stakeholders, including industry trade groups. This group will help staff fine tune the outreach, training, and implementation strategies and assist staff in understanding the needs and opinions of the affected entities.

During regulatory implementation, staff will research and explore alternative avenues for possible outreach, including possibly working with the DMV to include information as part of vehicle registration renewal.

Please see also the responses related to enforcement of the regulation in Chapter III-A-11 of this FSOR.

16)q) Change Timing of Reports to Board

1. **Comment:** I think the idea of doing some reports on what is going on with the technology is a good one. But, I would suggest that maybe January 2009 is too soon. You will not be able to tell what the price is actually going to be until the market starts up. This also would be probably just about a year after the regulation is formally kind of going into effect, after you get through your 45 days or 15 days and all that. So I would suggest that you not have that first report until 2010, at the earliest. 2011 would probably make more sense. (ENDEVF3)
2. **Comment:** The City supports ARB staff in reporting to the Board annually on the measures available to comply with the regulation, including updated costs and any recommended changes to the compliance timelines or exemptions. Staff is asked to specifically report on the impacts of the rule on small- and mid-sized businesses and public agencies that must comply with medium/large fleet requirements. This would include assessing any expected change in the value of existing equipment inventories once the regulation is adopted and how this might affect the firms' bonding ability which is required for City contractors. This assessment would also include assessing the ability of the businesses to respond to City bids, in general. (LACITY)

Agency Response: At the July 26, 2007 board meeting, the Board debated the timing of the reports back to the board, and settled upon the schedule in the final resolution:

By January 2009, provide a technology update report on the status of diesel emission control strategies that have been verified by ARB and are available for installation to comply with the March 1, 2010 compliance date; the report shall include an update on the number of devices that have been verified, the cost of those devices, and information on the ARB/South Coast Air Quality Management

District/Mobile Source Air Pollution Reduction Review Committee Off-Road Diesel Retrofit Showcase;

By December 2010, provide a status report on compliance with and enforcement of the March 1, 2010 compliance date for large fleets; the report shall include an analysis of the effect of the flexibility provisions of the regulations and the regulation's economic impacts; and

By December 2013 and 2017, provide updates on compliance and enforcement that respectively cover the period March 1, 2010 through March 1, 2013 and March 1, 2013 through March 1, 2017, and updates on engine technology, including engine and vehicle manufacturer progress in having compliant Tier 4 engines and vehicles in the California market in the later years of regulatory implementation.

The Board has the ability to request additional reports from the staff as often as they feel it is necessary, as well as to direct staff to report on specific issues such as cost, bonding, etc.

16)r) Help with Compliance Plan

1. **Comment:** We have offered the staff to come into our office, open our books, and review our costs to see how we can comply with this. And no one's come. Actually they did come and look at our fleet, look at our numbers. But we haven't heard anything back from them. Today I did offer them to have them look at our books and help us out to see where we can comply. And I hope they do so. (TC).

Agency Response: After the May Board hearing, staff completed an analysis of T. C. Construction's fleet, financial data, and expected compliance actions and costs. On July 11, 2007, ARB staff went to T. C. Construction in Lakeside, CA and met with T. C. Construction staff and went over their compliance plans and costs and expected impacts of the compliance costs on T. C. Construction's cash flow and profits. We appreciate T.C. Construction sharing their data with us.

17. General Opposition

1. **Comment:** This is going to be a tough regulation and we're not sure how we're going to meet the requirements. I think the discussions need to continue with staff until we come to some consensus. Let's do something that's reasonable. (SUKUT4)
2. **Comment:** Please do not adopt these restrictive, expensive and unnecessary regulations. Business owners are already at a disadvantage in California due to the high cost to do business in the state. (FITZGERALD)

3. **Comment:** Your agency does not listen or work with the people who make this state what it is. Back off your regulations and listen to these people. (FREETHY)
4. **Comment:** I have reviewed the proposed rule changes and consider them to be over the top. (FITZSIMMONS)
5. **Comment:** Once again the State of California has got their nose right in everybody's business putting more restrictions and regulations on everyone. Another example of why so many people are fed up and leaving this state. This state has too much government and the more we allow the worse it will get. This just means more government control. This approach doesn't work and in time it will fail, history has proven this. I will also be joining the others in leaving this taxed to death and overburdened government controlled state. (WATROUS)
6. **Comment:** I am afraid that the ARB has not heard from nearly enough of these people simply because they don't seriously believe there is any chance that such a regulation could ever be adopted at this time. The majority of the people I have mentioned this proposed legislation to in the construction trades believe that the negative impacts this legislation would have would be so obvious that no one would ever approve its adoption. Therefore, they are remaining quiet at the current time. However, I believe that the ARB, and other government officials (including state assemblypersons and senators), will hear an overwhelmingly large outcry from the people of this state if this proposed legislation is adopted and enforced. I think this legislation, if adopted, has the potential to embarrass the ARB after the ramifications of this legislation become apparent to rank-and-file Californians. (TURNER)
7. **Comment:** Nobody wants to breathe dirty air but this regulation is not the answer when our Governor has committed to a very aggressive public works agenda to bring back jobs, commerce, and safety to the State of California. (STEICO2)
8. **Comment:** The regulation will have profound, negative impact on our company, on many of our employees and the Governor's laudable infrastructure bond projects. (TCS)
9. **Comment:** You are moving too fast on this legislation. (ROMAN)
10. **Comment:** Who do you think will build the infrastructure that is needed for commerce in this state after you succeed in strangling the construction industry? You people are completely out of touch with reality when it comes to the costs and practicality involved in this latest regulation. (GWE)

11. Comment: Unreasonable because construction equipment is needed to build the infrastructure and buildings that will reduce car emissions, utilize renewable energy and conserve resources, resulting in even dirtier air. (PCCA)

12. Comment: I protest the severity of your proposed regulation. Most businesses in this state are hampered & crippled by excessive regulation already, not to mention the extreme costs! Many, many businesses have already exited this state and many more will, I being one of these considering that possibility. We know you have a job to do but don't go overboard with it. (KRAUS)

13. Comment: The current regulation is impossible to comply with, and has severe implications on those subject to the regulation and their ancillary factions. (EUCA1)

14. Comment: I would like to suggest that CARB more carefully consider the feasibility of the regulations and more directly engage construction companies and workers to determine a more reasonable and practical approaches to accomplishing its diesel emission objectives. (ERNST)

15. Comment: We are deeply disturbed by the potential regulations being promulgated by ARB for off-road in-use diesel equipment substantially reducing PM and NOx and accelerating the enforcement timeline. (MC)

16. Comment: I am greatly concerned about the in-use off-road diesel powered vehicle regulation that is under consideration by CARB and its effect on the construction industry. (FULLER)

17. Comment: California citizens should be able to have a quality life and quality opportunity to enjoy life without undue restrictions. I feel this set of regulations is another petty attempt to make rules and regulations impossible to follow. Please focus on removing the roadblocks, so citizens can earn a living (MOSS)

18. Comment: With CARB's proposed regulation, the State is placing conflicting and unattainable demands on heavy construction contractors like myself: execute the backlog of public infrastructure improvement projects while complying with unworkably stringent air quality standards. (RJB1)

19. Comment: Do not adopt these regulations. (GC3)

Agency Response: As discussed in Chapter II of the Staff Report, the regulation is necessary to prevent approximately 4,000 premature deaths (1,100

to 6,800, 95% confidence interval) and tens of thousands of cases of asthma-related and other lower respiratory symptoms, and provide a benefit of \$18 to \$26 billion in avoided premature death and health costs.

The regulation would achieve these health benefits by reducing emissions of diesel particulate matter (PM) and oxides of nitrogen (NOx) from nearly 180,000 off-road diesel vehicles in the State. As discussed in Chapter VI of the Staff Report, the regulation is expected to reduce 48 tons per day (tpd) NOx and 5.2 tpd of PM statewide in 2020. These reductions represent a 32 percent reduction in NOx and a 74 percent reduction in PM from the 2020 emissions that would otherwise occur in the absence of the regulation. As discussed in Chapter IV of the Staff Report, the regulation would achieve these emission reductions by requiring fleet owners to modernize their fleets and install exhaust retrofits.

As discussed in Chapter VIII of the Staff Report, we believe that there will be enough new and used vehicles and retrofit technology to allow fleet owners to comply with the regulation.

As discussed in Chapter VII of the Staff Report, the regulation is projected to achieve significant emission reductions, but at a significant cost to affected fleets. Overall, most affected businesses will be able to absorb the costs of the proposed regulation with no significant adverse impacts on their profitability. Manufacturing businesses are the least likely to be able to pass on their cost if the product they manufacture is sold nationally or globally, but the economic impact of the regulation is not expected to be a significant part of normal operating expenses. However, most construction fleets, rental companies, airlines, and landscaping service fleets who compete locally should be able to pass on some or all of the costs of compliance to their customers, thereby maintaining their profitability. Even if fleets were unable to pass on any of the cost of compliance to their customers, staff found that between about 60 and 80 percent of fleets would still be expected to be able to withstand the cost of the regulation without incurring more than a 10 percent change in their return on equity. Small fleets would be more likely to be able to absorb the cost of the regulation without exceeding 10 percent change in "return on owner's equity" (ROE) because they are not subject to the regulation's mandatory turnover provisions, and thereby would incur significantly less costs relative to medium and large fleets. The 20 to 40 percent of fleets for which the regulatory costs exceed a 10 percent change in ROE would have to pass through at least some of the costs to their customers to maintain their profitability.

The regulation is expected to raise the cost of construction in California by no more than 0.3 percent as fleets pass on the cost of compliance to their customers. Customers that could expect to pay higher construction costs include developers, home builders, and government agencies sponsoring road construction and other transportation projects. For the average new home buyer, the expected cost of the regulation could add about \$5 per month to a 30-year mortgage.

ARB staff developed this regulation in close coordination with a broad spectrum of stakeholders through a series of public workshops, workgroup meetings, Board meetings and public comment periods. These meetings were held in Sacramento, El Monte, Los Angeles, Fresno, San Diego and Riverside. Staff conducted these outreach efforts to give stakeholders the opportunity to participate in the regulatory development process. Staff have also met with individual stakeholders and contacted various industries, associations, individual businesses, and other organizations to inform them of the proposed regulation. Staff also made presentations to 58 companies and organizations. Staff also did two major mailings to licensed contractors in the State to inform them of the proposed regulation, a survey, and upcoming public meetings. Staff held 13 public workshops and eight informal public workgroup meetings over a three year period (since November 2004) to discuss development of the proposed regulation. Live internet broadcast webcasts were made available whenever possible and stakeholders were also able to call in and participate by phone at the Public Workgroup Meetings. As the regulatory development process progressed, the workshops became better attended such that over 1,000 people cumulatively attended the last series of four workshops.

Due to the variety of industries that utilize off-road vehicles, staff reached out to many different industries and associations. As discussed in Chapter III of the Technical Support Document, staff sent mailings to over 4,000 landfills, recycling facilities, and mining facilities and over 500 small airports in the state. Staff also sent letters to over 2,700 owners of portable equipment because many of them may also own mobile off-road vehicles. Staff also contacted rental companies, public utilities, individual construction companies, and all of the major airports in California to notify them about the development of the proposed regulation and to encourage their participation.

Staff also conducted two major mailings to licensed contractors in California in July 2005 and February 2007. The first mailing was sent to over 79,000 licensed contractors throughout the state from a mailing list provided by the Contractors State License Board (CSLB). Staff sent this mailing to licensed contractors with active or inactive licenses in 24 different license classifications that would most likely own heavy-duty diesel off-road vehicles. The letter informed the contractor of the development of the regulation and asked if they would like to receive further information either by email or regular mail and if they would like to participate in the ARB survey for in-use off-road vehicles. The second mailing was sent to over 290,000 licensed contractors using an expanded list from the CSLB that covered all licensed contractors in the state regardless of the license classification. The list included contractors with active or inactive licenses and those in arbitration. The postcard informed them of the proposed regulation and invited them to participate in upcoming public workshops.

During the first quarter of 2007, staff also contacted dozens of equipment dealers, those responsible for the majority of equipment sold in California, and asked them to send to their customers a flyer regarding the proposed regulation. Staff also contacted the California Independent Oil Marketers Association and asked them to provide the flyer regarding the regulation to buyers of diesel fuel. Chapter III of the Technical Support Document provides more detail regarding the outreach efforts. Staff appreciates all of the stakeholders who participated in the development of this regulation and provided invaluable input.

Please see the response in section III-A-3)f)iii) of this FSOR for a further discussion of how staff responded to stakeholder concerns regarding the regulation's impact on infrastructure. Please see also the response section III-A-3)f)iv) of this FSOR regarding the regulation's effect on the infrastructure bonds.

18. Do Something Else Instead of Regulation

18)a) Address the Gross Polluters on the US/Mexico Border First

- 1. Comment:** I will not accept any requirements for additional emission controls and cannot accept the waste of tax payers' dollars for more public meetings and workshops while at every Baja and Mexico border we can witness thousands of poorly maintained diesel trucks running on poorly refined oils entering the state of California. (CRA)

Agency Response: The ARB has a very aggressive regulatory enforcement presence at the Mexican border. As part of ARB's Heavy-Duty Vehicle Inspection Program, we have field representatives that work with the California Highway Patrol (CHP) at three border crossings at the California/Mexico border (Otay Mesa, Tecate, Calexico). In addition, ARB staff performs roadside checks of heavy-duty vehicles (both gas and diesel) in cooperation with the CHP.

The Heavy-Duty Vehicle Inspection Program requires heavy-duty trucks and buses to be inspected for excessive smoke and tampering, engine certification label compliance, and expired "low NOx" software (1993-1998.) Any heavy-duty vehicle traveling in California, including vehicles registered in other states and foreign countries, may be detained for tested. Tests are performed by ARB inspection teams at border crossings, CHP weigh stations, fleet facilities, and randomly selected roadside locations. Engine certification label compliance requires that any heavy-duty vehicle, including Mexican operated and/or registered vehicles, must be equipped with an engine meeting emission standards that are at least as stringent as federal emission certification standards for the year of engine manufacture.

Additionally, under California's regulations, a new vehicle (defined as a vehicle that has fewer than 7,500 odometer miles, and commonly known as a grey market vehicle) which is not certified to California's standards may not be sold within or imported into the state. If ARB staff finds that such a vehicle has

entered California, a Notice of Violation (NOV) is issued. The NOV requires that the vehicle be removed from California and that a civil penalty of up to \$5,000 per vehicle be assessed. The primary focus of enforcement is to ensure that all new vehicles sold, or offered for sale in the state are certified for sale in California.

A review of existing diesel truck regulations is discussed in this chapter of the FSOR.

2. **Comment:** ARB should also look at all the private diesel pick up trucks.
(CRA)

Agency Response: We agree. Like off-road vehicles and engines, ARB and U.S. EPA already have new engine standards that apply to new diesel pick-up trucks and heavy-duty trucks. However, like off-road vehicles subject to this regulation, there exists a substantial need and opportunity to achieve significant emission reductions in PM and NOx from these engines. As such, ARB is in the process of developing regulations for in-use heavy-diesel trucks and is considering whether pick-up trucks should be a part of the regulation. That rulemaking is scheduled to be considered by the Board in October 2008.

18(b) Start a Pilot Program First

1. **Comment:** The regulation should apply to public fleets before private fleets. The state of California, each county in California and each town and city in California has a significant fleet of off-road diesel equipment. We should start this project by implementing the regulations on each piece of this equipment first, instead of exempting it. Let them choose their options, keep the required records, and provide the required routine and emergency services expected of them for the first phase of implementation. Let them start immediately if they choose, but require them to start in 2009. This is a captive fleet that should be easy to study and evaluate and report results from. In 2012, take a year to prepare a comprehensive report of regulatory compliance, real, measured emission reduction, machine productivity changes, manpower adjustments, compliance costs, unforeseen challenges and workarounds and suggestions for the model of implementation strategies. In 2013, require implementation along the lines of the Construction Industry Air Quality Coalition (CIAQC) recommendation. Most effective leaders spend their own money first on research and development before demanding sweeping changes from stakeholders to implement unproven technology.
(FERMA) (FERMA2)
2. **Comment:** No reasonable action of this scope should be implemented without a controlled trial ahead of it. The asset value of off-road diesel equipment is quite high when purchased and it should not be devalued by a premature regulation or retirement. Nor should its productivity be

compromised. Routine and emergency work such as snowplowing and removal, shoulder reconstruction, pavement remediation, et cetera, is no more or less demanding than the work that the California contractor risks his net worth on every time he agrees to do a job. The final point is that California Air Resources Board is perceived to have a lot of clout. This has been demonstrated where market forces are a significant factor. That's not the case with this off-road diesel equipment, so I would like you to take that into consideration. (FERMA2)

Agency Response: The regulation applies to public fleets just the same as private fleets. It does not exempt public fleets. We considered having earlier implementation dates for public fleets but opted not to structure the regulation in that way for the following two reasons. First, the vast majority of affected vehicles are privately owned. As described in Chapter III of the Staff Report, government fleets only own about 4 percent of the vehicles affected by the regulation. Thus, exempting privately owned vehicles for the first several years of the regulation would exempt 96 percent of the off-road vehicles in the state, with a correspond significant loss in emission benefits. Second, we recognized that complying with the regulation will pose a fiscal challenge for both public fleets and private fleets, and staff believes that the challenge faced by private fleets is no more compelling than that faced by public fleets. While we expect many private fleets will be able to pass through at least some of the costs of the regulation to their customers, public fleets will need to allocate funds away from other budgeted items and/or will need to find other ways to generate new revenue to pay for compliance. For these reasons, ARB decided against the regulation having an earlier effective date for public fleets than private fleets.

We also do not support implementing the CIAQC recommendation (also called the CIAQC/CBCC alternative), as proposed by the FERMA and FERMA2 comments. The reasons why we do not support the CIAQC/CBCC alternative are discussed in detail in the response to comment III-A-8d)i) of this FSOR. To summarize here, the CIAQC/CBCC alternative contains no requirements until 2015, which means that this proposal will not achieve any emission reductions until 2015. Thus, the CIAQC/CBCC alternative would forego all the emission and health benefits of the regulation prior to 2015, and would fail to achieve any emission reductions in a major milestone year for the federally mandated State Implementation Plan (SIP).

The FERMA and FERMA2 comments also seem to suggest implementing something like the CIAQC/CBCC alternative with requirements beginning in 2013. We do not support this proposal because it would forego all emission and health benefits before 2013. The 2013 pilot program idea would have some benefits in 2014-2015, but not enough to meet the PM2.5 SIP commitments, nor make substantial progress towards meeting the goals of the Diesel RRP, and would forgo substantial health benefits. The regulation is expected to prevent 4,000 deaths over the course of its implementation, including 586 deaths before

2013. If this proposal were adopted, none of the emission benefits before 2013 would be guaranteed, and these 586 deaths would not necessarily be avoided.

Although we do not believe the regulation should be postponed until 2013, we do agree with the FERMA and FERMA2 comments that demonstration projects ahead of regulatory implementation are valuable. Chapter VIII of the Technical Support Document describes several construction and other off-road vehicle and equipment retrofit projects that were completed before adoption of the regulation. For example, ARB staff assisted with the South Coast Air Quality Management District (SCAQMD)/CIAQC Retrofit Demonstration project was in Southern California in 2001 to 2003. This demonstration included 12 scrapers and dozers that were retrofitted with diesel particulate filters.¹⁸ Currently, ARB, SCAQMD, and the Mobile Source Air Pollution Reduction Review Committee are in the midst of a \$5 million off-road retrofit showcase demonstration project. Among other things, this demonstration project is expected to spur the verification of many new off-road retrofit devices and is described in further detail in Chapter III-A-2 of this FSOR.

The efforts of ARB to work with stakeholders during development of the regulation are discussed in Chapter III-A-17 of this FSOR. The decrease in equity due to vehicle retirement is discussed in the response to section III-A-3)e)iii) of this FSOR. The exemptions for vehicles used for emergency operations is discussed in the response to section III-A-6)a)v)11) of this FSOR. That the regulation does not require technology that is unproven is discussed in the responses regarding technical feasibility of retrofits, repowers, and new vehicles in Chapter III-A-2 of this FSOR.

18)c,e,g,h) Regulate Someone Else First

- 1. Comment:** ARB should consider regulating the oil/diesel companies to clean up their products. They are the ones with all the money! (EVANS1)
- 2. Comment:** Agriculture runs some of the very same models of equipment as contractors, with the same engines and emissions, yet only the construction industry is subject to the regulation. (ECCO2)
- 3. Comment:** ARB should consider regulating big-rigs and buses instead of adopting this regulation. (MILLIGAN)

SCAQMD, 2005. South Coast Air Quality Management District, Air Resources Board. /Demonstration of Particulate Trap Technologies on Existing Off-Road Heavy-Duty Construction Equipment/. July 2005.
[http://www.meca.org/galleries/default-file/SCAQMD Trap Construction Project Study_v11 edited.htm.pdf](http://www.meca.org/galleries/default-file/SCAQMD%20Trap%20Construction%20Project%20Study_v11_edited.htm.pdf)

- 4. Comment:** ARB should consider a program to retire older, polluting automobiles. Reducing congestion on our roads, getting water to our crops and building new efficient school buildings are some other ways to benefit clean air. (FULLER)
- 5. Comment:** The ARB ought to be directing more regulations toward the main producer of air pollution: private vehicles. On-road vehicle emissions contribute more than half of particulate matter and nitrous oxide pollution in California. The off-road diesel vehicles targeted by the Board's proposed regulations contribute 20 percent or less of these emissions. (CBC) (CAR)
- 6. Comment:** ARB could make an even bigger impact on our air quality by making it unlawful for truck drivers to allow their vehicles to idle when not in actual use. It seems that truck drivers, from short delivery, to long haul, to pick-up drivers, are reluctant to shut off their engines when not driving. Idling wastes fuel and contributes to poor air quality. ARB should consider a regulation that would make it unlawful for a diesel truck to remain idling when it is unattended or in actions not associated with legitimate driving. (SALFEN)

Agency Response: ARB's mission is to promote and protect public health, welfare and ecological resources through regulations that effectively and efficiently reduce air pollutants where ARB has the regulatory authority to do so. Under state law, ARB has been directed by the Legislature to adopt airborne toxic control measures to address health risks posed by toxic air contaminants, including diesel particulate matter (PM), which has been identified as a known carcinogen (H&SC §§ 39650 et seq.). It has also been mandated to adopt as expeditiously as practicable, regulations to control, among other things, NOx and PM emission controls for off-road vehicles and equipment (H&SC §§ 43013(b) and 43018).

Additionally, federal clean air laws require areas with unhealthy levels of ozone and inhalable PM to develop plans, known as State Implementation Plans (SIPs), describing how they will attain national ambient air quality standards. (CAA § 110). State law makes ARB the lead agency for all purposes related to the SIP (H&SC § 39602), and thus ARB is constantly considering additional measures to reduce air pollution across the State.

In California, ARB is the primary regulatory authority for controlling mobile sources and consumer products, while local air pollution control districts have the primary authority to regulate stationary sources of air pollutants (stationary sources) within their jurisdiction. Under its authority, ARB has established numerous air pollution control programs, which include:

- Emission standards for new passenger cars and light-duty trucks;

- New standards for both diesel and spark ignited medium- and heavy-duty engines;
- Reformulated fuels (both gasoline and diesel);
- Standards for consumer products, and;
- Measures to implement the Diesel Risk Reduction Plan (Diesel RRP) and reduce emissions from in-use diesel engines.

In many cases, such as with reformulated fuels, both the U.S. EPA and ARB have established separate requirements. However, because of the unique air quality needs in California, often, as is the case with the reformulated fuels, the standards in the state are more stringent than in other parts of the country. An example of this is the requirements for ultra-low sulfur diesel fuel, which are discussed in more detail in Section A of Chapter VIII of the Technical Support Document.

As previously stated, under state law, California's 35 local air districts are responsible for developing rules and regulations addressing emissions from stationary sources. Under this authority, California air districts have developed many of the most stringent source-specific emission standards in the country impacting such sources of air pollution as refineries, power plants, and other industrial facilities. In support of these standards, local air districts also issue operating permits to stationary sources to ensure compliance with national, state, and local emission standards.

Combined, ARB and local air districts already have established numerous programs to reduce sources of air pollution caused by oil companies, public utilities, engine and vehicle manufacturers, agriculture, trucks, buses, light-duty on-road vehicles, and truck idling. The table below provides key ARB regulations and their initial adoption dates.

Regulation	Adopted
Transit Fleet Vehicles (TFV) - Trucks and Non-Urban Buses	2005
Transit (Urban) Bus Fleet Rule	2000
Commercial Solid Waste Collection Vehicles	2003
Stationary Compression Ignition (CI) Engines	2004
Portable Engines	2004
Transport Refrigeration Units (TRU) & TRU Generator Sets	2004
Fleet Rule for Public Agencies and Utilities	2005
Cargo Handling Equipment (Ports and Rail Yards)	2005
Commercial Harbor Craft	2007
Stationary In-Use Agricultural Engines	2006
Port and Rail Drayage Trucks	2007
Off-Road Large Spark-Ignition Engines and Equipment	1998
Small Off-Road Spark-Ignition Engines and Equipment	1990
Off-Road Recreational Vehicles	1994

New Off-Road Compression Ignition Diesel Engines	1992
On-Road Heavy-Duty Engines and Vehicles	Diesel Cycle: 1985 Otto-Cycle: 1986
On-Board Diagnostics	1989
Onboard Incineration on Cruise Ships and Oceangoing Ships	2006
Auxiliary Diesel Engines and Diesel-Electric Engines Operated on Ocean-Going Vessels	2005
School Bus Idling and Idling at Schools	2003
Diesel Fueled Commercial Motor Vehicle Idling	2004
Diesel Auxiliary Engines on Ocean-Going Vessels While At-Berth at a California Port (Shore Power)	2007
Lower Emission Vehicle/Zero Emission Vehicle	LEV I – 1990 LEV II – 1998
Consumer Products Program	Phase I: 1990 Phase II: 1997 Phase III: 1997 and 1999
Low Sulfur Diesel Fuel	1988
Reformulated Gasoline	Phase I: 1992 Phase II: 1996 Phase III: 1999

In addition, ARB is in the process of developing additional measures to address pollution from trucks, buses, and off-road agricultural vehicles. It is anticipated that the Board will consider an On-Road Bus and Truck Rule in 2008, and an Agricultural Off-Road Equipment regulation in 2009.

Also, the California Bureau of Automotive Repair administers a program called the Vehicle Retirement Program that pays motorists \$1,000 to retire cars that fail their biennial Smog Check, thereby removing gross polluting vehicles off of California's roads.

18)f) Raise Exhaust Pipes

- Comment:** There are some common sense measures that could have already been in place to reduce breathing diesel exhaust. Buses have caused this problem for years. Vehicles and equipment with horizontal low exhaust pipes need to be changed so fumes are not blown out at ground level and into people's faces. This is just common sense, but not all equipment and vehicles have vertical exhaust pipes. Vertical exhaust pipes could provide a very cost effective way to keep people from breathing fumes.

Agency Response: It is true that diesel bus exhaust pipes have been reconfigured in years past to reduce direct diesel exhaust exposure; however this measure, in itself, is not adequate to protect public health from off-road diesel

vehicle emissions. Due to the transport of NOx (a precursor to ozone and PM) and diesel PM, the contaminants from diesel exhaust are not restricted to an isolated area in close proximity to the exhaust pipe. Ozone and ozone precursors can be carried by winds over long distances and thereby contribute to air quality problems statewide. Additionally, due to the configuration of the vehicles (attachments, etc.), it may not be practical to install vertical exhaust pipes on all off-road vehicles that currently have horizontal exhaust pipes.

18)g) See above.

18)h) See above.

18)i) – Regulate Someone Else (Barrios, But Not Landfill/Recycle Centers))

- 1. Comment:** Our business, a landfill/recycle center, provides a clear public benefit and should not be singled out. (MALDONADO1)

Agency Response: We recognize that landfills and recycling centers provide an essential public service, but we disagree that landfill/recycle centers should be exempted from the regulation. The regulation does not single out any industry or operator. It applies to all owners of off-road diesel vehicles, which include thousands of businesses and agencies in dozens of industries. See also the responses at the beginning of Chapter III-A-18 of this FSOR for a further discussion of how ARB has or is in the process of regulating all sources of pollution within its regulatory authority.

Comment: If you would concentrate on cleaning up the barrios, or homeless ridden cities, this alone would save our pollution measurably. Also, the number of illegal immigrants living here that shouldn't be here. If they constitute the 20-25 percent that some predict, then their removal would reduce the impact on our air by a proportional amount. This would far exceed the gains you propose to make on this. (MOSS)

Agency Response: It is unclear how the commenter's suggestion would provide emission benefits, and addressing issues concerning the homeless and illegal immigrants is not within the scope of ARB's mission, or regulatory authority. ARB's mission is to promote and protect public health, welfare and ecological resources through regulations that effectively and efficiently reduce air pollutants where ARB has the regulatory authority to do so. Under state law, ARB has been directed by the Legislature to adopt airborne toxic control measures to address health risks posed by toxic air contaminants, including diesel particulate matter (PM), which has been identified as a known carcinogen. It has also been mandated to adopt as expeditiously as practicable, regulations to control NOx and PM emission controls for off-road vehicles and equipment. Additionally, federal clean air laws require areas with unhealthy levels of ozone and inhalable PM to develop plans, known as State Implementation Plans (SIPs), describing

how they will attain national ambient air quality standards. Much of California has unhealthy air, with the most severe problems being in the San Joaquin Valley and the South Coast Air Districts. State law makes ARB the lead agency for all purposes related to the SIP, and thus ARB is constantly evaluating additional measures to reduce air pollution across the State.

19. Authority and Legal Issues

19(a) Violates the Health and Safety Code (H&SC)

1. **Comment:** As explained below, ARB significantly understates the cost of its regulation, overstates the industry's ability to pass the increased cost on to its customers, and completely disregards the economic effect of devaluing the construction equipment currently in use. ARB should not adopt a regulation that would go so far as to qualify the entire industry for variance relief. See Health & Safety Code §§42352(a)(2), 42352.5(a)(2), 42368(a)(2) (authorizing such relief from an arbitrary, unreasonable taking of property and the practical closing and elimination of lawful businesses). (AGCA3)

Agency Response: We disagree. First, ARB has accurately estimated the cost of the regulation. Please see the response in section III-A-3)c) of this FSOR for a discussion of why ARB believes the cost estimate in the Staff Report and Technical Support Document is not understated.

Second, as described in Section B of Chapter VII of the Staff Report, ARB acknowledges that some fleets will need to pass on some of their compliance costs. Please see also the response in section III-A-3)e)vi) of this FSOR for further discussion regarding staff's estimates of what costs can reasonably be passed on.

Third, the economic impacts of the regulation were thoroughly evaluated and are discussed at length in Chapter XI of the Technical Support Document. The economic analysis took into account the fact that some equipment may be devalued in California and would therefore have to be sold out of state. Please see also the responses in section 3)e) of Chapter III-A-3 of this FSOR for further discussion of how staff's economic analysis took into account the regulation's effect on the value of existing equipment, fleets' equity, and bonding impacts.

Finally, the variance relief provisions of H&SC §§ 42350 et seq. do not apply to the off-road regulation. Those sections specifically address local air pollution control district and air quality management district rules and regulations. The off-road regulation does not include any variance provisions. The regulation does not result in an arbitrary, unreasonable taking of property. See ARB's response to comments 39-41 below in this section of the FSOR.

2. Comment: Before ARB can adopt an off-road engine emission standard to regulate criteria pollutant emissions from construction equipment, ARB must meet certain standards and obligations as set forth the California Health & Safety Code. By its terms, the code authorizes ARB to “adopt and implement motor vehicle emission standards... [that ARB] has found to be cost-effective..., unless preempted by federal law.” Health & Safety Code §43013(a); see also Health & Safety Code §§43013(b) (ARB’s off-road standards must be consistent with §43013(a)). The Code also requires ARB to consider approximate cost, before it can adopt an off-road engine emission standard to regulate air toxic emissions from construction equipment. Health & Safety Code §§39665(b)(5), 39666(c). ARB has significantly understated the cost of the regulation, and in turn, its cost effectiveness (as a cost-per-ton of reducing the pollutants that the regulation covers). (AGCA3)

Agency Response: We disagree. ARB has accurately estimated the cost and cost-effectiveness of the regulation and therefore complied with the standards and obligations in the California Health and Safety Code described above. Please see the response in section 3)c) of Chapter III-A-3 of this FSOR for a discussion of why ARB believes the cost estimate in the Staff Report and Technical Support Document is not understated. Please see the response in section 3)d)v) in Chapter III-A-3 of this FSOR for further discussion of why we believe the cost-effectiveness estimates in the Staff Report and Technical Support Document are not understated.

19)b) California Administrative Procedure Act (APA)

1. Comment: The Board should defer action on the proposed regulation to allow a meaningful opportunity for the submission and review of public comments. California law requires that public comments be considered by the Board before taking action on any regulation. Given the public comment deadline of July 26, just one day before the hearing at which the Board was scheduled to vote on the regulation’s adoption, it was impossible for the Board to meaningfully review the written comments before acting. Although the Board is authorized by California law to delegate various functions to the Executive Officer, it cannot legally direct the adoption of the regulation, make any statutorily required findings or reach any other conclusions concerning the proposed regulation until after ARB has reviewed and considered the written comments. (POHLE)

Agency Response: The APA, Government Code § 11346.8 provides that a state agency shall consider all relevant matter presented to it before adopting, amending, or repealing any regulation. Additionally, § 11346.9 of the APA requires that a state agency provide, in a final statement of reasons (FSOR), a summary of each objection or recommendation made regarding the specific adoption, amendment, or repeal proposed, together with an explanation of how the proposed action has been changed to accommodate each objection or

recommendation, or the reasons for making no change. ARB has complied with these requirements. First, at its July 26, 2007, meeting, the Board did not formally adopt the off-road regulation. Rather, after consideration of the record, including written comments and testimony received before the hearing, the Board approved the regulation for adoption and directed the Executive Officer to adopt the regulation, after considering all comments received, making necessary modifications to the regulation, and after having those modifications made available to the public for further public comment, to make such further changes as necessary to address the latter submitted comments. (See Board Resolution 07-19.) Under H&SC §§ 39515 and 39516, the Board may lawfully delegate such authority to the Executive Officer.

2. **Comment:** ARB has not provided 45 days to review the rulemaking package or any subsequent changes thereto. (PILCONIS) (AGCA3)
3. **Comment:** Because ARB intends to issue a revised proposed regulation at or just before the July 26 hearing at which the Board is scheduled to vote, ARB should provide 45 days from the release of any revised proposal for stakeholders to evaluate the revised proposal as a whole and prepare and submit written comments. Accordingly, the Board should not vote on the regulation at the July 26 Board meeting, but should defer action, at least until the next scheduled Board meeting. The comment period should be extended to allow the regulated community a full and fair opportunity to evaluate the proposal, as revised, and to provide factual, technical, and legal comment, and to allow the Board adequate time to review and consider the comments before acting. (AGCA3) (POHLE)

Agency Response: Consistent with the APA, ARB issued the initial notice for the regulation on April 6, 2007, more than 45 days prior to the first scheduled hearing date on May 25, 2007. (Gov't Code § 11346.4.) After a full day of hearing, the Board continued consideration of the matter until July 26, 2007. At the July 26 hearing, ARB staff made available proposed changes to the initial proposal for public review and Board consideration. The Board approved the suggested modifications and directed the Executive Officer to incorporate the modifications into the original proposal and to make those changes available for public review and comment for at least 15 days. ARB staff subsequently made the modifications available to the public in three separate Notices of Availability of Modified Text. APA § 11346.8 requires that any substantive changes be made available for public comment for at least 15 days. Here, ARB provided for each of the first two notices of modified text at least 30 days for public comment. For the third notice, ARB provided the minimum 15 days notice.

4. **Comment:** The APA requires California agencies to involve interested parties before a formal proposed regulation is released for public comment whenever it is "complex" and thus cannot be easily reviewed within the comment period. Contrary to ARB's obligation to engage in open and

participatory rulemaking, ARB staff first told the regulated community that it agreed with and would adopt a fleet average approach, but then later added the 2021 retrofit mandate, essentially resulting right back where ARB staff started before it received any industry input -- a de facto BACT approach -- without explanation. (POHLE)

Agency Response: The commenter is correct in saying that APA § 11346.5 requires that prior to proposing complex regulations that state agencies are to engage stakeholders in public discussions regarding the proposed regulation. ARB held numerous public workshops, workgroup meetings, and other outreach activities during development of this regulation. Thirteen public workshops were held at various locations in the State between November 2004 and March 2007 to discuss the proposed regulation and various alternative regulation concepts and proposals. Staff also conducted eight informal public workgroup meetings during this time period. In addition, as part of the regulatory development process, staff held numerous private meetings with representatives from various companies, industry associations, environmental organizations, regional and local agencies, and other interested parties, and sent out over 688,000 mailings to solicit input for the rulemaking.

The change mentioned by the commenter, adding a requirement that highest level VDECS be applied to remaining Tier 0 through 3 vehicles in 2021 was presented by staff and discussed with stakeholders at the February 20, 23, 26, and March 1, 2007 workshops held respectively in San Diego, Fresno, Sacramento, and Riverside. These workshops occurred approximately five months before the board voted on the proposed regulation.

This addition did not remove the flexibility granted by the fleet average requirements that allows fleets to choose to phase-in the most cost-effective compliance path. Instead, it simply requires that at the end of this eleven year-phase-in period fleets are required to apply the highest level VDECS available to their remaining non-Tier 4 vehicles.

5. **Comment:** The off-road regulation's failure to provide reasonable certainty or advance notice of the emission requirements a fleet must achieve due to the fleet average targets being dependent on the horsepower of affected vehicles, its imposition of unworkable retrofit requirements and regulation's other overly intrusive, inflexible mandates, render the regulation arbitrary and capricious and contrary to California's law governing agency rulemaking. (POHLE) (ATA1)

Agency Response: The regulation is neither arbitrary nor capricious, nor is it contrary to California's law governing agency rulemaking. ARB has thoughtfully considered the need for the regulation, its feasibility, and cost-effectiveness. (See Staff Report, Technical Support Document and responses in this FSOR.) As discussed at greater length in the response in section III-A-6)c)ii)1) of this

FSOR, we believe the structure of the fleet average targets in the regulation is necessary, reasonable, similar to the structure of other previously adopted regulations, and - in fact - fairer to fleets that targets that did not shift depending on a fleet's horsepower composition.

Because of lack of specificity, it is difficult to understand the commenter's general references to "other overly intrusive requirements, and to fully understand what he exactly means by saying that the regulation is "arbitrary and capricious and contrary to California's law governing agency rulemaking."

6. **Comment:** The proposed regulation, as presently drafted, is impermissibly complex and, as a result of such, would impose a great burden on the owners and operators of ground support equipment. Specifically, the proposed regulation's fleet average requirements and targets are subject to such great variability and unpredictability that effective compliance planning is impossible. The emissions targets identified in the proposed regulation readily vary each year because they are based upon the horsepower composition of each fleet on the given compliance date. As a result, the emissions targets cannot be readily predicted in advance with any amount of certainty. The extent of this uncertainty threatens to render the proposed regulation subject to a legal challenge based upon principles of administrative law and the requirement that agencies not proceed with their decision-making authority in an arbitrary or capricious fashion. (GDB)

Agency Response: ARB does not believe the regulation is impermissibly complex and therefore does not agree that it is subject to legal challenge based on this issue. See also the response to comments in section III-A-5)a) of the FSOR for a discussion of the complexity of the regulation. See also the response in section III-A-6)c)ii)1) of this FSOR for a discussion of why we believe basing the fleet average targets on the horsepower composition of each fleet is necessary, reasonable, similar to the structure of other previously adopted regulations, and - in fact - fairer to fleets than not doing so.

7. **Comment:** California's "clarity" standard, as required by Government Code section 11349.1, states that rules must be "written or displayed" so that "the meaning of regulations will be easily understood by those persons directly affected by them." A regulation shall be presumed not to comply with the 'clarity' standard if "the regulation presents information in a format that is not readily understandable by persons 'directly affected. See Calif. Code of Regulations (CCR) Section 16, Title 1. Persons shall be presumed to be "directly affected" if they "are legally required to comply with the regulation." Id. According to AGC members, the 33-page draft regulation plus another 203 pages of technical support is so complex and overpowering that very few contractors will understand it, much less be able to comply with it. (AGCA3)

- 8. Comment:** The off-road regulation does not comply with the APA standards for clarity. See text at 2449.1(a)(2)(A)(4) and 2449.2(a)(2)(A)(4). We realize that it is impossible to write a regulation with any significance that provides 100 percent clarity on all issues that may arise. (CIAQC9)

Agency Response: The off-road regulation meets the clarity standards as set forth in title 1, CCR, § 16. The regulation is written in plain English and uses the ordinary meaning of words. The language set forth in the off-road regulation is similar to that used in previously adopted in-use Airborne Toxic Control Measures adopted by ARB. (See title 13, CCR, §§ 2020, 2021 et seq., 2022 et seq., 2477, and 2479.) Every effort was made to make the regulation as clear and understandable as possible; however, we agree with CIAQC that, because of the diversity of sources covered by the regulation and the multitude of special situations that may arise during regulatory implementation, it may be impossible to craft a regulation with 100 percent clarity on all issues. Staff plans to issue guidance and advisories as needed to clarify special issues that may arise during regulatory implementation, and to make resources available to affected stakeholders to assist in understanding the compliance requirements of the regulation. To the extent that commenters have identified meritorious concerns regarding language that they believed to be unclear, ARB staff revised the language. For example, see Third Notice of Availability of Modified Text and rewriting of title 13, CCR, §§ 2449.1(a)(2)(A)(4) and 2449.2(a)(2)(A)(4).

- 9. Comment:** This regulation is extremely complex. We have identified 61 basic steps a large fleet would operator would need to take to comply with this rule. Many of the steps we identified are comprised of numerous separate assessments and actions the operator must take (for example, assessing technology options). In most cases operators would need to assess different compliance options, which would require he repeat steps and compare results. Finally, we identified the steps an operator would need to take to comply with a single compliance year. But the regulation has ten successively more stringent compliance dates annually from 2010 to 2020. Lower cost short-term compliance options could cost an operator more when he gets into later compliance dates. The regulation therefore requires an operator prepare a compliance strategy many years into the future; which multiplies the steps he must take many times and significantly adds to complexity.

The vast majority of these steps is not trivial and depends on detailed and accurate assessments and calculations involving engines, technologies, emissions, and so forth. Because the actions required by the regulation involve substantial capital, cover 10 years, and it takes many months for companies to secure capital needed for new equipment, engines and/or low emission retrofit technologies, the regulation depends on the ability of

companies to predict future economic conditions, which adds additional complexity as well as uncertainty.

We submit that this regulation does not come remotely close to the APA standard for the "complexity" aspect of "clarity." The regulation is "unnecessarily complex."

CARB indicated that this regulation was adopted in response to a mandate established by CARB's "Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel Fueled Engines and Vehicles," which CARB adopted in October of 2000. To date CARB has adopted a number of rules pursuant to that mandate including separate rules applicable to diesel engines in Waste Collection Vehicles, Transit Vehicles, stationary applications, transport refrigeration units, agricultural equipment, cargo handling equipment, and portable equipment. The In-Use Off-Road regulation is the only regulation that requires NOx control, the calculation of fleet averaging and emission targets, the calculation of carryover credits, and compliance requirements every year for ten years. It also the only regulation that requires the precise HP of every engine be verified. Many of the engines regulated under the In-Use Off-Road regulation are exactly the same engine as regulated under other adopted rules (for example portable equipment or cargo handling rules). If CARB can accomplish the same mandate with a far simpler rule, then the In-Use Off-Road regulation is unnecessarily complex. (CIAQC9)

Agency Response: See ARB's responses to comments in chapter III-A-5 of this FSOR regarding the regulation's complexity. As set forth therein, much of the length and numerous requirements of the regulation were included to provide stakeholders with necessary and precise directions on how to achieve the maximum emission reductions possible, while providing stakeholders with maximum flexibility.

The commenter listed the steps that a large fleet owner would take to attempt to find the most cost-effective path to compliance. Although we recognize that the regulation is detailed, we feel that the commenter's characterization overstates the complexity of the rule. It is possible to make any task seem complex by describing it in great detail and dividing it into trivially small steps. For example, it is possible to divide brushing one's teeth or changing a baby's diaper into dozens of individual steps, but that does not mean these tasks are beyond the comprehension of average citizens.

We would also like to note that the fleet average provisions which necessitate most of the steps listed by the commenter were added as a direct result of stakeholder feedback requesting fleet average provisions to provide more flexibility in the regulation. If fleets wish to avoid the detailed requirements of the fleet average provisions, they may choose to comply with the relatively simple

and straightforward BACT requirements of turning over 8 to 10 percent of fleet horsepower each year and retrofitting 20 percent of fleet horsepower each year. ARB could have adopted a regulation mandating that all fleets comply with the BACT provisions, and thereby avoided the issue of perceived complexity, but that would have removed much of the flexibility and would have increased costs for affected fleets.

ARB also disagrees with the commenter's conclusion that it could accomplish the same mandates under federal and California law with a far simpler rule. It seems to suggest that a "far simpler" regulation would, among other things, not include any requirements to achieve NOx reductions, which the Board has determined to be necessary for the State to achieve compliance with federal national ambient air quality standards. (CAA § 210.) To disapprove the regulation for inclusion of the NOx element of the regulation would be contrary to APA § 11349.1(c), which effectively requires that OAL "not substitute its judgment for that of the rulemaking agency as expressed in the substantive content of the adopted regulations."

Finally, the commenter's assertion that the regulation is the only regulation that requires NOx control and the calculation of fleet averaging and emission targets is false. Many previous ARB in-use fleet rules contain these elements. The Portable Equipment Air Toxic Control measure requires calculation of fleet average and emission targets. In fact, the structure of those targets is identical to that of this regulation. Similarly, the Fleet Rule for Transit Agencies includes NOx controls as well as the calculation of fleet averages for both PM and NOx. The Urban Bus Rule also contains NOx control. Lastly, the Large Spark Ignition Regulation includes fleet averaging and NOx control.

10. Comment: Under the APA, to enact a "regulation," ARB must consider any adverse effects on small businesses that would have to comply with the proposed regulation. Gov't Code 11346.2(b)(3)(B). Specifically, the ISOR document must "describe reasonable alternatives to the regulation that would lessen any adverse impact on small business and the reasons for rejecting those alternatives. Id. ARB's rulemaking documents note that the regulation has the least stringent provisions for the smallest fleets owned by small businesses or municipalities. TSD, at 185 ("The provisions in the regulation for small fleets and medium fleets would reduce the potential impact on these businesses and would reduce any adverse impact on their bonding amount."). AGC disagrees with ARB's findings and maintains that the proposal would still disproportionately increase costs for small fleets and put a significant percentage of California's contractors out of business. (AGCA3)

Agency Response: We disagree and believe we have satisfied APA's requirement to consider effects on small businesses. As noted by the commenter, the regulation contains special provisions to make the regulation

easier for small fleets, including exempting them from the NOx provisions of the regulation and giving them until 2015 to begin complying with the PM provisions of the regulation. Small business costs are described in Chapter XI of the Technical Support Document. Please see also the responses in section III-A-3(a) of this FSOR for a discussion of why we believe the regulation will be affordable.

19(c) Preemption under Clean Air Act and U.S. EPA Authorization

- 1. Comment:** EPA does not have authority to grant a waiver for engines less than 175 hp. Section 209(e)(1) of the federal Clean Air Act preempts any state, including California, from setting any emission-related standards or other requirements for construction and farm equipment under 175 horsepower. Congress intended that these smaller pieces of construction and farm equipment enjoy the same preemption that applies to locomotives under Section 209(e)(1). Accordingly, ARB cannot adopt fleet standards or any other type of emission standard to apply to construction equipment under 175 horsepower. (CIAQC7)

Agency Response: The commenter has mischaracterized the scope of the CAA § 209(e)(1) preemption. Section 209(e)(1) preempts states from adopting and enforcing any standard or other requirement relating to the control of emissions from new engines less than 175 hp used in construction or farm equipment and vehicles. But Congress created a special exception for California in CAA § 209(e)(2)(A), allowing the state to adopt such standards and other requirements for all nonroad engines used in vehicles and equipment not expressly preempted in section 209(e)(1) (i.e., new locomotives and new farm and construction vehicles and equipment with new nonroad engines under 175 hp) upon receiving authorization from U.S. EPA.

As interpreted by U.S. EPA, “new” as used in the CAA has a very specific definition and it has been applied differently for locomotives than for all other nonroad applications. (See Air Pollution Control; Preemption of State Regulation for Nonroad Engine and Vehicle Standards (Final § 209(e) Rule, 59 Fed.Reg.36969 (July 20, 2004) and Emission Standards for Locomotives and Locomotive Engines; Final Rule, 63 Fed.Reg. 18978 (April 6, 1998). In the Final § 209(e) rule, U.S. EPA defined “new” as:

A domestic or imported nonroad vehicle or nonroad engine the equitable or legal title to which has never been transferred to an ultimate purchaser. Where the equitable or legal title to an engine or vehicle is not transferred to an ultimate purchaser until after the engine or vehicle is placed into service, then the engine or vehicle will no longer be new after it is placed into service. A nonroad engine or vehicle is placed into service when it is used for its functional purposes. The term ultimate purchaser means, with respect to any new nonroad vehicle or new nonroad engine, the first person who in good faith purchases such new nonroad vehicle or new nonroad engine for purposes other than resale. This definition

shall not apply to locomotives or engines used in locomotives. (40 CFR Part 85, § 85.1601; *italics* in original; underlined emphasis added.)

In *Engine Manufacturers Association v. EPA (EMA)*, (D.C. Cir. 1996) 88 F.3d 1075, 1082-1086, the Court of Appeals affirmed U.S. EPA's definition of new for nonroad sources other than locomotives. U.S. EPA subsequently defined "new" for purposes of the locomotive preemption much broader than for other nonroad sources, finding a locomotive to be new up to 133 percent of the locomotive engine's useful life from the date of initial manufacture or remanufacture. (63 Fed.Reg. 18978.) The distinction drawn by U.S. EPA between nonroad sources in general and locomotives was never challenged.

In EMA, the Court addressed the issue of U.S. EPA's definition of new for nonroad engines in general and its impact on the CAA § 209(e)(1)(A) preemption of new engines under 175 hp used in farm and construction vehicles and equipment. The Court gave deference to U.S. EPA's application of the Allway Taxi doctrine to the nonroad preemption. (*Id.*, at 1085.) In *Allway Taxi, Inc. v. City of New York (Allway Taxi)*, (S.D.N.Y) 340 F. Supp. 1120, aff'd (2d Cir. 1972) 468 F.2d 624, the district court interpreted CAA § 209(a) preemption for on-road motor vehicles and found that the preempted states and other local jurisdictions could not regulate new motor vehicles the moment after they were purchased, even though the statute explicitly limited the preemption to showroom-new motor vehicles. (*Id.*, at 1124; EMA, *supra*, 88 F.3d at 1082. However, the court went on to say that a local jurisdiction could regulate motor vehicles and not be preempted after passage of a reasonable period of time. (*Allway Taxi, supra*, 340 F.Supp. at 1124 [at time of resale or reregistration of the vehicle].)

The off-road regulation at issue here does not attempt to immediately regulate farm and construction sources covered by the §209(e)(1) preemption. Indeed the regulation exempts any vehicle from the PM retrofit requirement that is less than five years old and from the NOx replacement requirement that is less than 10 years old. Vehicles that are not expressly covered by the §209(e)(1) preemption may be regulated at anytime, so long as ARB requests and obtains authorization from U.S. EPA.

Finally, as the EMA court recognized, the Allway Taxi doctrine was intended to ensure that state emission controls be sufficiently delayed from the original sale of the vehicle so that the burden of compliance would not fall on the manufacturer of the engine. (EMA, *supra*, 88 F.3d, at 1082 and 1085, citing *Allway Taxi* [local regulation at the time of resale or reregistration would not be preempted because the burden of compliance would be on individual owners and not on manufacturers or distributors].)

2. **Comment:** The in-use off-road regulation includes fleet average emission standards and BACT requirements, both of which are emission standards, and pursuant to CAA § 209(e)(1), ARB is expressly preempted from

regulating nonroad engines used in farm and construction vehicles.
(CIAQC7)(PILCONIS)(AGCA3)

Agency Response: See agency response to comment 13 above. ARB agrees with the commenter that the regulation does establish in-use emission standards for covered vehicles, but disagrees that it is preempted from regulating such vehicles. The regulation does not apply to “new” engines, and ARB has made it clear that it intends to seek authorization prior to enforcing the regulation.

3. **Comment:** ARB has noted that it must obtain authorization from the EPA administrator prior to the off-road regulation becoming effective. To ensure that there is no misunderstanding between regulated stakeholders and ARB, ARB staff should specifically identify the provisions they consider subject to EPA authorization. (CALCIMA) (PILCONIS) (AGCA3)
4. **Comment:** Although the CAA preempts ARB from adopting or attempting to enforce standards until EPA grants a waiver of preemption, 42 U.S.C. 7543(e), ARB’s proposed rules have fixed milestones for compliance and near-term, time bound prohibitions. For example, Section 2449(d)(7)(A) prohibits the addition of “Tier 0” vehicles after March 1, 2009. Given the timelines required for standard EPA waiver-of preemption proceedings, ARB likely will not have received a waiver of preemption by March 1, 2009. Moreover, in this first-ever EPA waiver proceeding for in-use and retrofit standards, EPA likely will take longer than usual to resolve the novel issues presented here. ARB’s proposed regulation should include provisions for delaying the effective date of all provisions until a reasonable time after EPA grants a waiver of preemption. (AGCA3)

Agency Response: See agency response to comments 13 and 14 above. In EMA, the Court described CAA § 209(e)(2)(A) as an implied preemption that in general prohibits states from adopting emission standards and other requirements relating to the control of emissions from such vehicles or engines. (EMA, 88 F.3d at 1086.) Congress, however, carved out an exception for California, because of its long history of regulating mobile sources and its leadership in addressing air pollution and serving as a laboratory for the nation. (Id., at 1090.) As stated, under CAA § 209(e)(2)(A), ARB may adopt regulations for all off-road sources that are not expressly preempted under § 209(e)(1), but must obtain authorization from U.S. EPA prior to enforcing the regulations. U.S. EPA has distinguished between regulations that require a new authorization and those regulations or parts of regulations that fall within the scope of previously granted authorizations. (See e.g., California State Nonroad Engine and Vehicle Pollution Control Standards; Notice of Within the Scope Determinations. 65 Fed.Reg. 69763 (November 20, 2000). To the extent that an ARB adopted regulation falls within the scope of a previously granted authorization, ARB has authority to immediately enforce after the regulation becomes effective.

As the commenter acknowledges, ARB will be requesting an authorization from U.S. EPA for the performance requirements and accompanying enforcement provisions of the off-road regulation. ARB presently believes that much, but not necessarily all, of the new regulation will require a new authorization. Among the provisions that will require a new authorization are: the NOx and PM fleet emission averages, the NOx fleet turnover requirement, PM BACT retrofit requirements, and the associated enforcement provisions, such as record keeping and reporting requirements. But ARB believes that certain elements referred to in the regulation, such as emission standards for new off-road engines, are covered by previous ARB requests for authorization, and that once granted by U.S. EPA, those elements of the regulation would be within the scope of the previously granted authorizations.

ARB is expecting U.S. EPA to act timely on its request, and that ARB will have the necessary authorization by March 1, 2009. Contrary to the commenter's assertion, this is not the first in-use regulation that ARB has submitted to U.S. EPA, and ARB believes that the federal agency will be familiar with the issues that the off-road regulation raises and the authorization should not be delayed. ARB intends to immediately enforce the regulation once it receives authorization.

5. Comment: Under §209(e), California cannot "adopt" the off-road regulation until after it obtains EPA authorization. Although EPA has sought to interpret the statute to preempt only enforcement of an emission standard, but not its adoption, any such position is contrary to the plain language of the statute and is invalid. (CIAQC7)

Agency Response: U.S. EPA is the expert administrative agency entrusted to interpret and implement the CAA. It is well established that courts typically will defer to an expert administrative agency's interpretations of the statute for which it has been entrusted to administer. As the commenter recognizes, U.S. EPA determined in 1994 that the implied preemption of section 209(e)(2) did not prohibit California from adopting its regulations prior to seeking authorization. (See 59 Fed.Reg. 36969, 36981-36982. (July 20, 1994.) This determination was never challenged, and the time for such a challenge has long since passed. (CAA section 307(b) [a petition requesting review must be filed within 60 days of the final regulation being promulgated].)

6. Comment: Among other prerequisites to obtaining EPA authorization under CAA § 209(e), a California nonroad emission standard must be consistent with CAA section 202(a). That section requires, among other things, that emission standards shall be applicable to vehicles and engines for their useful life and must be achievable through the application of technology that EPA determines will be available based on the standards for the relevant model year, giving consideration to cost, energy, and safety factors. (CIAQC7)

- 7. Comment:** ARB's standards must be consistent with federal requirements for technological feasibility in order for those standards to qualify for a waiver of federal preemption. (PILCONIS) (AGCA3)
- 8. Comment:** Emission standards are to apply for the useful life of the equipment, as established by EPA regulation, and provide adequate "stability" such that the standards do not change for each model year allowing OEMs the cost-efficiencies of implementing the same emission control levels for multiple model years of equipment before being required to redesign to accommodate the next level of controls. (POHLE)

Agency Response: U.S. EPA has long interpreted "consistent with section 202(a)" to be a two-pronged analysis: "California's standards and accompanying enforcement procedures are not consistent with section 202(a) if (1) there is inadequate lead time to permit the development of technology necessary to meet those requirements, giving appropriate consideration to the cost of compliance within that time frame or (2) the Federal and California certification test procedures are inconsistent." (California State Nonroad Equipment Pollution Control Standards, Authorization of State Standards; Notice of Decision [for California's Utility and Lawn and Garden Regulation], 60 Fed.Reg. 37740 (July 20, 1995), Decision Document, at 39; see also 209(e) Final rule, 59 Fed.Reg. 36969, 36983 (July 20, 1994).) The question of consistency of the federal definition of useful life of the vehicle or engine has never been at issue in U.S. EPA's determinations in granting either an authorization under CAA § 209(e)(2) or a waiver under § 209(b). (See e.g., (California State Motor Vehicle Pollution Control Standards, Waiver of Federal Preemption; Decision [for California's On-Board Diagnostic System II Regulation], 61 Fed.Reg. 53371 (October 11, 1996).) Indeed, Congress has expressly acknowledged California's right to adopt in-use emission standards, without reference to useful life of the vehicle, that are necessary for the state to meet compelling and extraordinary environmental conditions confronting the State. (See CAA § 209(e)(2)(A).

Finally, with regard to the question of stability, U.S. EPA has never considered that factor in the context of nonroad authorizations. It has only been at issue in the context of promulgating new on-road heavy-duty vehicle emission standards. (See CAA § 202(a)(3)(C).)

- 9. Comment:** CAA §202(a)(2) requires that standards "take effect after such period as [EPA] finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." Although EPA's past waiver proceedings involved cost to the manufacturer, the standards at issue were manufacturer-based standards. Here, by contrast, the standards are for end-users because ARB's proposed off-road standards apply to private fleet owners and operators. As a result, in this unprecedented waiver

proceeding, EPA will need to consider the technology and cost of compliance from the perspective of the private end-user's regulated fleets. (PILCONIS) (AGCA3)

Agency Response: ARB acknowledges receipt of your comment, but only U.S. EPA can properly answer it.

10. Comment: CAA§202(a)(1) expressly requires that “standards shall be applicable to such vehicles and engines for their useful life (as determined under [§202(d)],” and §202(d) expressly incorporates §207. In America Motors Corp. v. Blum (American Motors Corp.), 603 F.2d 978, 981 (D.C. Cir. 1979), the D.C. Circuit reversed EPA’s waiver of federal preemption for an ARB standard that deprived small manufacturers of additional lead-time that §202(b) required federal standards to provide. In essence, ARB and EPA reasoned that §209 required consistency with the lead time requirements in §202(a), not those in §202(b). The court rejected that limited view because it found §202(b)’s “congressional mandate... to assimilate or incorporate” its requirements into §202(a). *Id.* Under Blum, California standards must meet CAA’s useful-life criteria to qualify for consistency with §202(a). (PILCONIS)(AGCA3)

Agency Response: See response to comments 13-14. The commenters’ inappropriately rely on American Motors Corp, a case that should be narrowly read as providing additional lead time relief to small on-road motor vehicle manufacturers. In Motor Equipment Manufacturers v. Nichols (MEMA III), 142 F.3d 449, the D.C. Cir. confirmed U.S. EPA’s reading that in reviewing consistency with CAA § 202(a), both U.S. EPA and the courts have always looked at lead time and consistency of certification test procedures and nothing more, stating:

In the waiver context, section 202(a) “relates in relevant part to technological feasibility and to federal certification requirements.” [Ford Motor Co. v. EPA, 606 F.2d 1293, 1296 n. 17 \(D.C.Cir.1979\)](#); see also [MEMA I, 627 F.2d at 1101, 1111](#). The “technological feasibility” component of section 202(a) obligates California to allow sufficient lead time to permit manufacturers to develop and apply the necessary technology. [footnote omitted] See [American Motors Corp. v. Blum, 603 F.2d 978, 981 \(D.C.Cir.1979\)](#). The federal certification component ensures that the Federal and California test procedures do not “impose inconsistent certification requirements.” Waiver of Federal Preemption, [46 Fed.Reg. 26,371, 26,372 \(1981\)](#). Neither the court nor the agency has ever interpreted compliance with section 202(a) to require more. See, e.g., [MEMA I, 627 F.2d at 1101, 1111; Ford Motor Co., 606 F.2d at 1296 n. 17; American Motors Corp., 603 F.2d at 981](#). (MEMA III, *supra*, 142 F.3d at 463).

The MEMA III Court further expressly rejected the argument that other subsections of CAA §202(a) that do not deal with lead time should not be

considered in the consistency analysis, even if the subsection expressly cross-references § 202(a). (Id., rejecting petitioner's claim that U.S. EPA must consider CAA § 202(m) when deciding consistency with § 202(a); see also [Ford Motor Co., 606 F.2d at 1297](#) (observing that Congress had permitted California to adopt different specific emissions requirements than those provided in the CAA)). Accordingly, the commenter's assertion that the requirements of CAA § 202(d) should be considered must be rejected.

11. Comment: To obtain an authorization, California must show that it needs its in-use off-road standards to address compelling and extraordinary conditions...As a matter of federal law, California does not need a retrofit rule to further California's unsupported views under the Tanner Act. Specifically, ARB has failed to determine, based on an assessment of risk, whether any level of emission reduction is adequate or necessary to prevent an endangerment of public health and to identify whether a threshold value for diesel PM exists. (PILCONIS)(AGCA3)

Agency Response: Commenters are correct in that for ARB to obtain authorization from U.S. EPA, the Administrator cannot find that California does not need the adopted standards to meet compelling and extraordinary conditions. The Administrator has consistently recognized that California is confronted with compelling and extraordinary conditions when granting waivers for motor vehicles under section 209(b) and authorization for California's nonroad regulations under section 209(e) of the CAA.

The relevant inquiry under section 209(e)(2)(A)(ii) is whether California needs its own emission control program to meet compelling and extraordinary conditions, not whether any given standard is necessary to meet such conditions. In approving waivers under section 209(b), the Administrator has determined that:

"[C]ompelling and extraordinary conditions" does not refer to levels of pollution directly, but primarily to the factors that tend to produce them: geographical and climatic conditions that, when combined with large numbers and high concentrations of automobiles, create serious air pollution problems. [Citations omitted.]

California and the South Coast and San Joaquin Valley air basins, in particular, continue to experience some of the worst air quality in the nation. The unique geographical and climatic conditions, and the tremendous growth in vehicle population and use that moved Congress to authorize California to establish separate vehicle standards in 1967, still exist today.

In response to the undisputed severe air quality problems in California, the California Legislature authorized the ARB to consider adopting, *inter alia*, standards and regulations for nonroad engines. Given the serious air pollution problems California faces and the resultant need to achieve the maximum

reductions in emissions, ARB found it necessary that in-use emission standards be established for off-road diesel engines and that it is necessary to more tightly control such emission sources to meet federal and state air quality standards.

Commenters are in error when they assert that ARB has failed to determine, based on an assessment of risk, whether any level of emission reduction is adequate or necessary to prevent an endangerment of public health and to identify whether a threshold value for diesel PM exists. As explained in the Technical Support Document, ARB fully considered the need for the regulation and the health risks posed by in-use off-road diesel sources.

12. Comment: ARB's record suggests mixed data on whether diesel PM has a carcinogenic threshold: Based upon on information available, the report could not identify a threshold below which no significant adverse health effects are anticipated. It has been suggested that information based on the rat data suggested the presence of a threshold. However, the same data suggests that the rat data may not be relevant to humans. ARB cannot establish that it needs the proposed standards as a matter of federal law. Before ARB seeks a waiver of preemption based on Tanner Act criteria, ARB should answer the question whether the rat data are relevant to humans. If those data are relevant, ARB should set a threshold value for diesel PM. If this data is not relevant to humans, ARB or California should commission the appropriate studies with species that would be relevant to humans." (PILCONIS)(AGCA3)

Agency Response: Staff agrees that the human data lend more confidence in the prediction of human risks than the data from the rat studies because of the uncertainties of extrapolating from rats to humans. Therefore, the Office of Environmental Health Hazard Assessment (OEHHA) derived the human risk estimates based only upon the epidemiological findings and not the rat data.

For example, the Garshick et al. (1987a) case-control study and the Garshick et al. (1988) cohort study of U.S. railroad workers were used to estimate the risk of lung cancer in the general population due to diesel exhaust. These two studies were selected for quantitative risk assessment because of their quality, their apparent finding of a relationship of cancer rate to duration of exposure and because of the availability of measurements of diesel exhaust among similar railroad workers from the early 1980's in other studies. The case-control study (1987) has an advantage in providing direct information on smoking rates, while the cohort study (1988) has an advantage of smaller confidence intervals in the risk estimates.

Based upon information available, no threshold was identified below which no significant adverse health effects are anticipated. This finding was approved by the Scientific Review Panel (SRP) on April 22, 1998. This is typical of cancer effects – numerous TACs have a determination of "no threshold" specified.

When there is no threshold of significant adverse health effects, a range of risk for exposure is determined. The SRP approved the range of risk estimated by OEHHA in the Staff Report for the Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant.

13. Comment: The CAA contemplates that original equipment manufacturers (OEMs), not end-use consumers, will incorporate required emission control technologies into engines and vehicles. The primary means for reducing mobile source emissions under the CAA and the complementary California statutory scheme is through emission standards for new engines. A fundamental premise of those statutes is that new emission control technologies should be developed and implemented into engines and vehicles by OEMs. OEMs are best suited for this task, as they have the technical expertise to develop the necessary technologies, and to identify and resolve implementation and operational issues presented by incorporation of emission controls. Placing directly on OEMs the regulatory burden to engineer solutions to emission control problems also provides the appropriate incentives for OEMs to apply their expertise and resources to achieve the goals established by EPA or California. Requiring end users to determine how to integrate VDECS into their vehicles is like requiring them to invent new emission control technology.

End-use consumers lack any direct control over OEMs, and end-users of specialized, diverse equipment representing a small OEM market, such as GSE, lack significant market leverage over OEMs. Thus, the CAA statutory scheme (including the criteria for EPA authorization of a California standard) is written and premised upon the fundamental principle that requirements to develop and incorporate emission controls into vehicles are to be placed on OEMs, and not end-users.

The CAA statutory scheme strikes a careful balance to preserve the economic viability of OEMs and limit the cost impacts for end-users who purchase the equipment. See; e.g., Motor and Equip. Mfrs. Ass 'n v. EPA, 627 F.2d 1095, 1118 (D.C. Cir. 1979) ("Congress wanted to avoid undue economic disruption in the automotive manufacturing industry and also sought to avoid doubling or tripling the cost of motor vehicles to purchasers. It therefore requires that emission regulations be technologically feasible within economic parameters."). The CAA requires that any new engine emission standards must be technically feasible for OEMs to achieve, and must provide OEMs with adequate lead-time to develop and integrate the technologies into new engines and vehicles, taking cost into account. (POHLE)

14. Comment: The adopted off-road rule's heavy reliance on forcing end-users to integrate emission control retrofits into existing vehicles conflicts

with the fundamental purposes and objectives of the federal Clean Air Act and is preempted under the doctrine of conflict preemption. (POHLE)

Agency Response: The contention of the commenter that OEMs, not end-users, are the sole stakeholders responsible for meeting California's emission control requirements for off-road sources under federal and California law is belied by the fact that Congress has expressly recognized that California may adopt in-use emission requirements for non-new engines under 175 hp used in farm and construction vehicles and equipment and all other new and non-new engines used nonroad vehicles and equipment, with the exception of new locomotives. By U.S. EPA's definition of "new," a non-new engine, vehicle or piece of equipment, are no longer in the ownership or control of the OEM. Any regulation applying to non-new sources must be addressed by the person who owns and operates the source, and that is not the OEM.

In response to the D.C. Circuits opinion in EMA v. EPA, *supra*, 88 F.3d 1075, U.S. EPA issued a direct final rule that became effective on March 2, 1998. (62 Fed.Reg. 67733 (December 30, 1997).) In EMA, the Court found that in its final rule establishing emission standards for nonroad diesel engines at or above 37 kilowatts (kW) (59 Fed.Reg. 31306 (June 17, 1994), U.S. EPA had incorrectly limited the implied preemption of CAA § 209(e)(2) and California's ability to obtain a waiver from such a preemption, to cover only new nonroad engines not otherwise expressly preempted by CAA § 209(e)(1). The Court found the implied preemption to cover in-use engines as well. (EMA, *supra*, 88 F.3d at 1092.) To address the Court's ruling U.S. EPA modified the interpretive rule found in Appendix A to subpart A of the 1994 final 37 kW rule. (62 Fed.Reg. at 67735.) Appendix A was clarified to read that California has authority to adopt in-use retrofit requirements, but must obtain authorization from U.S. EPA. (*Id.*) As stated elsewhere, California is on record that it will request authorization from U.S. EPA and believes that the regulation fully comports with the criteria of CAA § 209(e)(2) that the Administrator must consider in granting authorization, including that the standards are technologically feasible in the time required for compliance, giving appropriate consideration to costs. (See Resolution 07-19.)

California law authorizes ARB to adopt in-use emission controls. (See H&SC §§ 39667, 43013, and 43018.) For example, § 39667 provides that ARB shall consider adopting revisions to the emission standards for vehicular sources and that "except for regulations affecting new motor vehicles . . . regulations adopted pursuant to this section shall be based on the utilization of the best available control technology or more effective control methods . . ." (Emphasis added.) Section 43018 directs the ARB to endeavor to achieve the maximum degree of emission reductions possible from vehicular and other mobile sources in order to accomplish the attainment of the state ambient air quality standards at the earliest practicable date and that the ARB take whatever actions are necessary, cost-effective, and technologically feasible. Among other things that the Board is

directed to address are reductions of in-use emissions from all classes of motor vehicles.

OEMs are not necessarily the best or most qualified persons to develop and install new emission control technologies on in-use vehicles. An entire industry has sprouted up developing aftermarket emission control technologies (e.g., member of the Manufacturers Emission Control Association). ARB has adopted regulations requiring that verified diesel emission control strategies be used on in-use vehicles (see Verification Procedures Warranty and In-Use Compliance Requirements for I-Use Strategies to Control Emissions from Diesel Engines (VDECS Procedures), title 13, California Code of Regulations, §§ 2700 et seq.). These aftermarket manufacturers have the expertise to develop required technologies. ARB is not requesting that the end users to develop and to personally install VDECS on their vehicles. An industry of professional installers has also blossomed (e.g., Ironman). Finally, to the extent that required technologies cannot be developed for specific engines or cannot be verified by ARB, the regulation exempts stakeholders from having to comply with the regulation's BACT requirements.

See also the response in section III-A-6)a)i) of this FSOR for a discussion of why it is not sufficient to regulate OEMs, and why we must instead also impose requirements on end-users of vehicles.

15. Comment: ARB's approach in this regulation is the result of having just a few years ago decided not to require OEMs to include additional PM emission controls in new Tier 3 engines, apparently in response to OEM arguments about technical feasibility and cost-effectiveness. ARB now effectively seeks to require end-use consumers of vehicle, who lack the technical expertise and resources of OEMs, to install retrofit modifications to engines. ARB has failed to explain why it elected not to impose more stringent PM standards on new Tier 3 engines. Nor has ARB adequately explained why, just a few years later, it now believes it is appropriate and technically feasible to impose essentially the same requirements on operators of the equipment, who have little or no expertise integrating emission controls into vehicles. ARB should not, and legally cannot, retroactively change its Tier 3 standards by seeking to impose those requirements after-the-fact through end-user mandates that require retrofit and early replacement. (POHLE) (CSIA)

Agency Response: ARB concurs that in adopting the Tier 3 standards for new off-road engines in 2000 it determined that diesel particulate traps were not required. The regulation for new off-road diesel engines was adopted pursuant to the "Compression-Ignition Engine Statement of Principles" (SOP) entered into between ARB, U.S. EPA, and the Engine Manufacturers Association in 1996. The underlying reason for the SOP was that ARB and U.S. EPA, to the greatest extent feasible, would attempt to align their regulations to avoid manufacturers

from having to comply with different emission standards for the same engines. Pursuant to the SOP, the U.S. EPA in 1998 promulgated new emission standards, including standards for Tier 3 engines. The federal Tier 3 standards did not include a PM emission standard more stringent than those required for Tier 2 engines. Accordingly, the federal Tier 3 standards did not require the use of diesel particulate filters (DPF's). The amendments formally adopted by the Board on January 28, 2000, were designed to harmonize California's emission standards and test procedures as closely as possible with the federal program, while still maintaining the emission reduction benefits of the current California program. Harmonization resulted in the California new Tier 3 engine standards to similarly not require the use of DPFs. The issue of more stringent PM emission standards was deferred to an anticipated 2001 technical review hearing. In 2004, when next addressing emission standards for new off-road engines, both U.S. EPA and ARB adopted Tier 4 standards for new engines and included more stringent PM emission standards, which effectively require DPFs or other aftertreatment devices being installed on new vehicles.

Irrespective of what was decided in 2000, there is no question today that requiring in-use vehicles to be retrofitted with diesel particulate filters (DPFs) is necessary, technically feasible, and cost effective. (See Technical Support Document (TSD), chapters IV, VIII and IX.) As outlined in the TSD, many areas of California continue to be out of attainment with federal and state ambient air quality standards for ozone and PM. Additionally many areas of the state are subject to high risk from exposure of diesel PM, an identified toxic air contaminant. The need for the emission reductions from the regulation is described in Chapter II of the Staff Report. See also the responses in section 1 of this FSOR for further discussion of the need for the regulation.

In 2008, there is no question that DPFs and other aftertreatment devices are technologically feasible. DPFs have been required on all new heavy-duty on-road diesel vehicles since the 2007 model year, and there is no evidence that the traps do not work. ARB's verification procedure ensures that any technology verified is effective, durable, and warranted. Since the Tier 3 standards were promulgated, ARB has verified three active DPFs that can be used in off-road applications on engines that have PM levels certified to the Tier 2 and Tier 3 standards for new engines. As such, technology is available today to retrofit these vehicles and engines, and the retrofit requirements in the off-road rule are neither arbitrary nor capricious. Staff has demonstrated that DPFs will provide significant emission benefits for existing engines. Other technologies, such as passive DPFs and flow through filters are being developed and will likely go through the verification process. To the extent that verified devices are not available for specific applications, are unsafe in use, or their use conflicts with other laws, the off-road regulation provides exemptions from compliance. See also the responses in section III-A-2)a) of this FSOR for additional discussion of the technical feasibility of VDECS.

As explained in section XI.H. of the TSD, the PM requirements of the regulation are cost-effective. See also the response section III-A-3)d)v) of the FSOR for additional response regarding the cost-effectiveness of requiring the retrofitting of vehicles with VDECS.

For the reasons set forth above, the PM BACT requirements are necessary, technologically feasible, and cost-effective, and are in accord with state and federal law. The commenter has provided no basis for its argument that the requirements cannot be adopted. As explained in the response to comment 28 above, ARB has authority to adopt in-use emission standards and requirements for off-road vehicles. Such authority implicitly contradicts the commenter's assertion that you cannot subsequently adopt new requirements for vehicles that are no longer new.

16. Comment: In proposing the off-road rule, ARB did not address the technical feasibility, design, or integration issues of retrofitting ground support equipment (GSE) with diesel particulate filters. ARB had previously identified the difficulties in retrofitting GSE with diesel particulate filters when considering adopting more stringent standards for new Tier 3 engines. (POHLE)

Agency Response: While ARB acknowledges that some GSE may not be amenable to retrofit with VDECS, it believes that many will. If a VDECS cannot be safely, effectively installed on any vehicle, then the regulation does not require that they be retrofitted. Please see the response in section III-A-2)a)xx) of this FSOR for further discussion of GSE and VDECS and the response in section III-A-2)a)iii)2) of this FSOR for a discussion of how it is not possible for verification to include installation issues.

17. Comment: In addition to considering express preemption, the D.C. Circuit also will need to consider whether the Clean Air Act impliedly preempts ARB's standard. In Motor & Equipment Mfrs. Ass'n, Inc. v. EPA, 627 F.2d 1095, 1108 n.20 (D.C. Cir. 1979), the D.C. Circuit held that the elements of CAA's federal motor-vehicle regime that fall outside §209's express preemption could not qualify for implied or conflict preemption. In reaching that conclusion, the court relied on the general presumption against preemption and CAA's specifically including both an express-preemption clause (§209) and a general savings clause (§116). Id. Recent Supreme Court decisions have, however, rejected that rationale for excluding conflict preemption. See Geier v. American Honda Motor Co., 529 U.S. 861, 873 (2000) (neither savings clause nor express preemption provision bars working of "conflict preemption"); Buckman Co. v. Plaintiffs' Legal Comm., 531 U.S. 341, 352 (2001) (same); U.S. v. Locke, 529 U.S. 89, 107-08 (2000) (presumption against preemption applies only if "the field which Congress is said to have preempted has been traditionally

occupied by the States" and not if there is a history of significant federal presence); Buckman, 531 U.S. at 347 (same). (PILCONIS) (AGCA3)

Agency Response: ARB duly notes the comment, but as the commenters' acknowledge, the question raised is really for the courts to answer. But having said that, ARB does not believe that any conflict exists here that would result in implied preemption. As previously stated, the CAA has authorized only California to adopt in-use emission standards for non-road engines; U.S. EPA is authorized only to adopt new emission standards for nonroad engines. (CAA §§ 209(e)(2) and 213; EMA v. EPA, 88 F.3d 1090-1092.) As recognized by the D. C. Circuit in EMA, that prior to the adoption of the CAA amendments in 1990, the states, particularly California, were in the lead in regulating nonroad engines, and there has been no history of federal presence. (Id., at 1090.)

19(d) Preemption under Federal Aviation Acts

1. **Comment:** The regulation is preempted by the Airline Deregulation Act of 1976 (ADA). The ADA provides that a state "may not enact or enforce a law, regulation, or other provision having the force and effect of law related to a price, route, or service of [an] air carrier. This language "express[es] a broad preemptive purpose," and ADA preemption applies even if a state law is not expressly designed to affect airline prices, routes, and service, and even if the impact is only indirect. (See Morales v. Transworld Airlines (Morales), 504 U.S. 374, 383 (1992) (holding that ADA preempted state law requirements that expressly referred to airlines and established "binding requirements" upon them).) Thus, any state law "having a connection with, or reference to, airline 'rates routes, or services'" is preempted. (See id at 384.) ADA preemption extends to regulation of GSE and airport support vehicles because such equipment is "integral" to carriers' services. (Federal Express Corp. v. California Pub. Util. Comm'n (Fed Ex), 936 F.2d 1075, 1078 (1991 9th Cir.)

While Congress enacted the ADA "to end federal economic regulation of commercial aviation and to promote competition within the airline industry," at the same time, it made clear that it "did not intend to leave a vacuum to be filled by the Balkanizing forces of state and local regulation. The off-road regulation would, effectively, regulate changes to airline decisions about flying to and from California airports by imposing an invasive and costly state GSE regulation that will result in substantial GSE functionality and reliability issues, and increase the costs and burdens of supporting aircraft with diesel GSE. The off-road regulation is therefore preempted under the ADA.

The regulation will be extremely costly to implement, and ARB staff concedes that these costs can and must be passed along in the form of increased prices. ARB specifically lists airlines among the industries expected to pass the regulation's costs to their customers. The rule,

therefore, is subject to ADA preemption because of its direct effect on airline prices. In addition, the impacts of the regulation on airline routes and services would have financial implications that would affect the cost of flying to certain airports and be reflected in airline prices.

The rule's uncertain and ever-shifting requirements, its intensive and technology forcing mandates, and the attendant GSE operational and reliability problems that will inevitably occur through efforts to comply, will impact airline decisions concerning routes and services in a manner that is not tenuous, remote or peripheral, but significant and direct. The regulation would require fleet owners to make sweeping changes to GSE fleets each year, and deprive them of the ability to engage in meaningful fleet planning, impacting the availability, functionality, and reliability of key equipment in such a way as to alter an airline's ability to fly particular aircraft to and from California airports. Certain aircraft, such as the largest wide-body aircraft used in international and cross-country flights, require special types of GSE or have uniquely intense or demanding GSE requirements, and any impact on availability or a pattern of unreliability with such GSE would affect airlines' decisions to use California airports. Older aircraft may also be designed to function with existing GSE, so any changes to design or integration of new equipment, or uncertainty regarding the Rule's requirements, could force airlines to reroute those older planes to other airports outside the state.

The regulation would require changes to (1) airport infrastructure, (2) the composition of the GSE fleet, and (3) allocation of GSE among California airports, all of which would affect routes and the availability of air transportation service to communities by adversely impacting the capacity of airports throughout the state to support airline operations, including aircraft maintenance routes and time-sensitive cargo service. As a result, airline decisions concerning whether to provide expanded service to California airports, or reduce such service in favor of competing airports in neighboring states, would be impacted by the rule's effects on GSE capacity to handle flight traffic efficiently and ensure on-time delivery. Limiting the GSE capacity at California airports to handle increased volume of air traffic or certain types of aircraft will force airlines to route flights to other airports and limit or eliminate service to communities in contravention of the language and purpose of the ADA. In the likely event that GSE capacity to accommodate routine or stand-by maintenance is reduced or affected by the rule, the volume or type of flights routed through California airports will necessarily be affected. A range of diesel-powered GSE is critical to ensuring that aircraft are serviced properly and quickly so that they may return to operation safely and on time. The impacts of the regulation on such equipment will affect the ability of California airports to continue to make available the existing level of maintenance support, and thus alter airline decisions concerning routes

and services. All of these impacts flow directly from restrictions on GSE use and availability imposed by the off-road regulation and as such subject the regulation to preemption under the ADA. The high costs associated with the regulation could also directly and significantly impact decisions on airline routes and services. (POHLE)

Agency Response: See following response to comment [33] regarding preemption under the Federal Aviation Administration Authorization Act of 1994 (FAAAA). ARB disagrees with the commenter's view that the requirements for airport ground support equipment are preempted by the ADA. While the ADA preemption has been broadly applied by the courts against local and state regulation in certain instances, the courts have not addressed the question of whether the potential conflicting mandates of the ADA and the CAA must be harmonized. That is, in the CAA, Congress expressly granted to California authority to regulate new and in-use off-road engines not otherwise expressly preempted under CAA § 209(e)(1). As explained in comment 13, the CAA, as amended in 1990 (14 years after enactment of the ADA preemption at issue here), Congress expressly provided California in CAA § 209(e)(2)(A) with authority to adopt emission standards and other requirements related to the control of emissions for all new and non-new off-road engines other than new nonroad engines under 175 hp used primarily in farm and construction vehicles and equipment and new locomotives and locomotive engines. Based upon the plain language of the expressed preemption, one must assume that Congress wanted to limit the preemption to just those few specified categories and intentionally did not preempt GSE equipment. This is especially true given that Congress was very aware of the aviation industry at the time that it adopted § 209(e)(2), and chose only to expressly preempt states and local governments from regulating aircraft and aircraft engines. (See CAA § 233.) Although Congress dealt with the subject area of nonroad engines, it did elect to preempt nonroad engines used in GSE.

Recently in *Rowe v. New Hampshire Motor Transport Ass'n*. (Rowe)

S.Ct. ___, 2008 WL 440686, February 20, 2008, the Supreme Court re-examined its earlier decision in *Morales* and found that the ADA does not generally preempt all state public health regulations, distinguishing those state regulations that broadly prohibit certain forms of conduct and affect stakeholders only in their capacity as a general members of the public from regulations that are specifically directed at carriers. (*Id.*, at 8.) The off-road regulation is a regulation of general applicability that applies to all owners of off-road diesel vehicles and is not limited in its application or intended to discriminate against air carriers and their GSE. Further, in finding that the public laws at issue in *Rowe* did not qualify as a public health exception, the Court noted its concern that the Maine legislation could potentially open the door to a patchwork of different state regulations. (*Id.*) The possibility of patchwork regulation is not at issue here. Under the CAA, Congress authorized only California to adopt in-use emission control standards for non-road engines. Under the CAA, there can only be one

national standard since U.S. EPA also was not provided with any authority to regulate in-use nonroad engines. (See EMA v. EPA, *supra*, 88 F.3d at 1090.) Other states, if they elect to adopt emission standards for nonroad engines, may only opt to adopt California's emission regulations (CAA § 209(e)(2)(B)), and may not adopt their own independent standards.

ARB disagrees on the commenter's reliance on the Ninth Circuit's decision in Fed Ex. There the Court found that the preemption of the ADA should not be read "so literally or without attention to the context of other law into which the statute fits." (Fed Ex, *supra*, 936 F.2d at 1078.) Consistent with this, subsequent enactment of the CAA amendments in 1990 and the authority granted therein to California to regulate in-use off-road engines must be considered and reasonably harmonized with the federal preemption found in the ADA, especially in light of Congress' failure to include GSE equipment in the express preemption of CAA § 209(e)(1).

ARB disagrees with the commenter's characterization that the off-road regulation will affect airline decisions to fly into and out of California airports by imposing an invasive and costly state GSE regulation that will result in substantial GSE functionality and reliability issues, thereby increasing the costs and burdens of supporting aircraft with diesel GSE, and drastically affecting airport operations. Much of the perceived harm is purely speculative. First, as stated, the regulation is not a GSE specific regulation; it is a regulation that will be applied across industries on almost all diesel off-road equipment over 25 hp that operate in California. The regulation specifically addresses the commenter's concerns about functionality and reliability of equipment affected by the regulation by exempting fleet owners from having to retrofit or turnover vehicles for, among other things, when no VDECS or Tier 3 or 4 engines are available, or if the GSE is considered to be a specialty vehicle for which no suitable engine is available to repower the GSE or no used vehicle, with a cleaner engine, is available that can perform work equivalent to that of the GSE.

We acknowledge that some fleets will need to pass on some compliance costs. Our return on owner's equity analysis, which is described in Section VII.E. of the Staff Report, however, concluded that only 20 to 40 percent of fleets would need to pass on some compliance costs to customers to avoid a 10 percent change in return on owner's equity.

2. **Comment:** The Federal Aviation Act of 1958 (Aviation Act) establishes a "uniform and exclusive system of federal regulation" of aircraft operations that preempts state and local regulation. The off-road regulation as proposed is preempted as it would profoundly impact the ability to plan and maintain the reliable GSE fleet critical to the safe and efficient operation of the National Airspace System. The regulation is particularly burdensome and problematic as applied to diesel GSE, due to its highly specialized nature and critical role in the safe and efficient functioning of

the National Airspace System. The regulation will require our members to spend over \$100 million and replace or retrofit virtually every diesel unit of GSE in California.

The pervasive federal regulatory scheme of the Aviation Act extends not only to aircraft in flight, but also to aircraft-related operations on the ground. *City of Houston v. Federal Aviation Administration* (*City of Houston*), 679 F.2d 1184, 1195 (5th Cir. 1982). As the Federal Aviation Administration (FAA) has confirmed, "reliable GSE equipment is essential to safe and efficient use of navigable airspace. Diesel GSE in particular perform a myriad of complex and time-sensitive functions essential to the safe and efficient use of the National Airspace System. These functions include aircraft maintenance, fueling, deicing, starting aircraft engines, moving aircraft to and from the gate, and loading, unloading, and sorting cargo and baggage. The ability of GSE to perform all of these activities quickly, reliably, and in close coordination with each other and with the various types of aircraft in operation at various airports each day, directly affect the ability to move aircraft efficiently from the gate, through the runway queue, and into the National Airspace System safely and on schedule. Any state regulation impacting ground operations that interferes with the "movements and operations of aircraft" intrudes upon the intensive and exclusive federal authority over aviation and is preempted by the Federal Aviation Administration Authorization Act of 1994 (FAAAA). (See *City of Burbank v. Lockheed Air Terminal* (*City of Burbank*), 411 U.S. 624, 633-34 (1974).) Imposing ever-shifting annual conversion requirements on GSE that will frustrate fleet planning and prevent the certainty and predictability required to day-to-day aircraft ground service, and by requiring implementation of untested retrofit technologies and vehicle replacements that will limit the functionality and availability of GSE (and hence the aircraft they support), the proposed regulation would adversely affect the movement and operation of aircraft and is therefore preempted by the Aviation Act.

The FAA has recognized the integral role played by GSE in support of aircraft operations, and as such concluded that state regulations that impose mandates "directly, or indirectly" affecting the ability of GSE to support the movement and operation of aircraft are preempted under the federal acts. This interpretation of the scope of preemption is entitled to deference, as the FAA is the expert federal agency vested with exclusive and primary authority over aviation. (Letter from Paul Dykeman, Deputy Director, Office of Environment and Energy, Federal Aviation Administration to Donald Zinger, Assistant Director for Transportation and Air Quality, U.S. EPA, at page 8, (August 24, 2000).

The FAA exercises primary and exclusive jurisdiction over aviation-related operations and its interpretations in such matters supersede state law.

Arapahoe County Pub. Airport Auth. v. FAA (Arapahoe), 242F.3d 1213, 1220-1221 (IOth Cir. 2001). (POHLE)

3. Comment: The proposed regulation fails to acknowledge that the ARB and the airport proprietors lack regulatory authority. The County continues to recognize and acknowledge that John Wayne Airport can and should play a role in helping to reduce unnecessary air emissions in the South Coast Air Basin and the State of California. However, it is important for us to emphasize the limited regulatory authority of the ARB and the local public entities which own and operate air carrier airports. We are concerned that the ARB, via this proposed regulation, is unlawfully intruding into a federally preempted field of regulation. Arguably, this proposed regulation, if implemented, would significantly impact the maintenance of a reliable ground support equipment fleet, which is crucial to the operation of the National Airspace System. This impact would contravene the Federal Aviation Act and the Airline Deregulation Act. (GDB)

Agency Response: See response to comment [32] regarding the scope of the ADA preemption, the need to harmonize the preemption with authority granted to California under the CAA, and the speculative and overstated nature of the commenter POHLE's concerns about the regulation's effect on GSE performance, specifically, and airline operations in general. In 1994, Congress adopted a preemption in the FAAAA closely paralleling the preemption in the ADA. Previously the Federal Aviation Act described by the commenter POHLE did not have an express preemption. In analyzing the preemption, the Supreme Court recently held in Rowe that it would follow the reasoning of Morales, finding that the scope of the two preemptions in the two aviation acts were similar and the Maine tobacco laws at issue in Rowe were preempted. Rowe, *supra*, S.Ct., 2008 WL 440686, at 4.

The cases cited by the commenter POHLE are misplaced. In City of Houston, the Fifth Circuit did not address the principal question at issue here: harmonizing the authority granted to California to adopt in-use emission standards for off-road vehicles and equipment under the CAA and the preemptions set forth in the FAAAA. (See discussion in the Agency Response to the preceding comment.) That decision was decided six years before Congress adopted § 209(e)(2) as part of the amendments to the CAA in 1990, and more than 10 years before Congress adopted the preemption in the FAAAA. Additionally, City of Houston dealt principally with the Port Preference Clause of the U.S. Constitution and the FAA's authority to limit nonstop air flights. GSE were neither the subject of nor mentioned in the decision.

The City of Burbank case occurred more than 16 years before the amendments to the CAA were adopted in 1990, and 20 years before the FAAAA preemption was enacted. The Court thus did not address the issue of harmonization. That

case focused more on the federal Noise Control Act and the City's efforts to reduce noise from nighttime air traffic, than it did on the Federal Aviation Act and the preemption at issue here. Like City of Houston, the Court did not consider the question of preemption of GSE. Additionally, the Court in City of Burbank, as in Rowe, was concerned with the possible Balkanization of local regulations, making it difficult for interstate carriers to operate. (City of Burbank, *supra*, 411 U.S. at 639.) As explained in the Agency Response to the preceding comment, under the CAA only California is authorized to adopt in-use emission standards for off-road equipment and vehicles and no issue of Balkanization exists.

The Tenth Circuit's decision in Arapahoe is also inapposite. There the case involved a decision by the FAA to deny a local Colorado airport authority grant money because the authority failed to follow its obligations under federal grant assurances and whether a Colorado Supreme Court decision enjoining the FAA from acting was preempted. The case directly involved air carrier services and routes, and the Court recognized the FAA's authority to interpret and implement the federal aviation statutes. (Arapahoe, *supra*, 242 F.3d at 1020. The case did not involve and there was no discussion about the CAA or whether GSE equipment can be regulated there under.

The FAA's letter from Paul Dykeman to Donald Zinger at U.S. EPA is not dispositive that California's regulation of GSE equipment is preempted under federal law. The fact that the letter was written indicates that there was no consensus regarding preemption between the two agencies, both of which are expert administrative agencies respectively interpreting the laws under their jurisdictional authority.

In sum, ARB disagrees that the regulatory action is *per se* preempted by the aviation statutes.

See also the response in section III-A-6)c)ii)1) of this FSOR for a discussion of why the regulation's targets are not "ever-shifting", and why it is fair, reasonable, and necessary for the regulation to have fleet average targets based on horsepower.

4. **Comment:** There are approximately 200-300 different makes and models of GSE in operation at airports in California today, performing very specialized functions. While extraordinarily diverse, the total number of GSE in California is relatively small, accounting for approximately 1% of the equipment subject to the proposed rule. Within this 1%, there are very small sub niches of GSE that perform extraordinarily specialized functions at airports, and for certain GSE types there may exist fewer than a handful of units even at a major airport (if not in the entire State). The addition of retrofits or use of any new engine technologies in GSE requires additional engineering, design, and development by airlines that are often forced to seek to work together with OEMs. The fact that emission control

technologies exist, and may have been tested on other types of vehicles, does not resolve the issue of the technical feasibility of installing VDECS retrofits on GSE.

ARB's unspoken and unsupported assumption of technical feasibility is also at odds with the conclusions EPA reached in its June 29, 2004, rulemaking regarding the "Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel." 69 Fed. Reg. 38958. At that time, EPA recognized that the integration of existing emissions reduction technologies into nonroad engines would be "challenging and will require additional time to develop," even for OEMs with the organic engineering capability and resources that operators lack. (POHLE)

Agency Response: We acknowledge that installation of retrofits can be challenging and that some GSE will not be amenable to retrofit with VDECS. However, if a VDECS cannot be safely, effectively installed on any vehicle, then the regulation does not require the retrofits. Please see the response in section III-A-2)a)xx) of this FSOR for further discussion of GSE and VDECS and the response in section III-A-2)a)iii)2) of this FSOR for a discussion of how it is not possible for verification to include installation issues. .

19)e) Geographical Restrictions

1. **Comment:** Although it has not yet adopted a geographically restricted vehicular standard, ARB considered adopting the South Coast Air Quality Management District ("SCAQMD") fleet rules as SCAQMD-specific ARB standards in the aftermath of SCAQMD's loss in the Supreme Court over whether CAA §209 preempts consumer-based standards. *Engine Mfrs. Ass'n v. SCAQMD*, 541 U.S. 246, 252-55 (2004). An ARB standard with appropriate geographic limitations would prevent spreading the rule's economic dislocation to other parts of the California that do not need the rules to address truly compelling and extraordinary conditions. (PILCONIS) (AGCA3)

Agency Response: Recognizing that many off-road fleets operate throughout the State, the foundation of the off-road regulation, as adopted by the Board, sets forth a statewide protocol to reduce diesel PM and NOx emissions. The final regulation, however, also includes a Surplus Off-road Opt-in for NOx (SOON) program that allows districts in need of additional NOx reductions to achieve them if they agree to provide incentive money to fund any additional turnover required of fleets that operate exclusively within the district. The SOON program is an ARB regulation that will be overseen and enforced by ARB. As stated, under SOON, fleets will not have to comply unless the opt-in districts elects to fund the additional turnover over of vehicles requested by the district. Accordingly, the program should not result in any economic dislocation. Additionally, it does not apply to those vehicles in the fleet that operate outside of

a district that elects to participate in the SOON program. The SOON program is discussed further in the responses in Chapter III-A-9 of this FSOR.

2. **Comment:** We would like to see consistency coming from the Board. We've heard from the South Coast and the San Joaquin Valley about their concerns, and we've heard that potentially other local districts could ask for their own authority to do a rulemaking. And what we would like is certainty. I have to go to my management with certainty on how we're going to comply with this regulation. And I can tell you our initial strategy, which only covers, say the first three years of our strategy, is upward of \$15 million. And the last thing I think we need is the uncertainty of possible dual regulations. Essentially a different regulation from a different authority could really throw a wrench in the works. So what I'm requesting of this Board is that please do not vote for this regulation unless industry is certain that we're only going to have one regulation to comply with, not more than one rule. (CAPONI)

Agency Response: See agency response to comment 34 above. The commenter seems to be specifically referring to the SOON Regulation, which is part of the ARB off-road rule. (Title 13, CCR, § 2449.3.) Although the program authorizes local districts to opt in and decide whether they want to fund additional NOx reductions from fleets operating within their jurisdictions, the SOON program is part of the overall statewide regulation. Section 2449.3 sets forth the parameters on how the local district's are to implement the SOON program if they elect to opt in, and the respective district programs will be under the oversight of ARB, which must approve the programs as implemented and which has sole authority for enforcement. This will ensure that the programs are fairly and consistently implemented and enforced throughout the state.

3. **Comment:** One of the most significant objections to the required retrofit devices is that there are no assurances that if a covered fleet complies with this regulation, the local Air Districts will not impose even more stringent regulations for covered equipment operated in their jurisdiction. We request that there be a period of time, at least a few years, before local Air Districts are permitted to impose even more stringent regulations to limit emissions. (GLATKY)
4. **Comment:** Project owners have already begun setting entirely different emissions requirements than the regulation calls for. (ECCO2)
5. **Comment:** One thing that's really important for our members is the certainty aspect of any regulatory action, whether it be a federal regulation or a state regulation like this one, because our folks are thinking about what purchases they will be making in the coming years. We also have other members who are going to be operating throughout the state. So the issue about whether or not we have multiple regulations could be very

significant for those folks who are operating throughout the states and trying to move equipment in and out and they're reporting as a fleet, as we were just discussing. I mean I'm not absolutely certain how that would work. But the idea that we might have more than one regulation to deal with for some of our members is troubling to me. (ARA4)

Agency Response: Under the Health and Safety Code ARB has the responsibility for regulating the emissions of vehicular sources. (H&SC §§ 39002, 40000; see also H&SC §§ 43000.5, 43013(b), and 43018.) Despite the authority granted to ARB in the above sections, local air districts have some authority over motor vehicles to the extent that such authority is expressly provided in the Health and Safety Code. (H&SC §§ 39002, 40000.) Section 40717.5(a) provides that districts may implement rules to regulate indirect sources of pollution by, among other things, encouraging ridesharing and alternative transportation. Section 40716 further provides that districts, in carrying out their responsibilities to achieve attainment of state ambient air quality standards, may adopt and implement regulations to accomplish, among other things, reduction or mitigation of emissions from indirect sources of air pollution.

In a recent decision, a California court found that pursuant to these above-referenced sections, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has broad power to adopt regulations to mitigate the effects of indirect source pollution, which includes the power to impose fees on a developer for emissions that are not otherwise mitigated. (See tentative decision in California Building Industry Association v. SJVAPCD, Case No. Q6 CL CG 02100). In that case, SJVAPCD had adopted a rule that among other things required developers to reduce NOx and PM10 emissions from construction equipment used on their projects. A developer could choose to reduce emissions, by among other ways, utilizing newer equipment, altering fuel type, modifying older engines, or installing after-treatment control devices. As stated, the court found that the rule was a permissible regulation of an indirect source.

ARB does not believe that the SJVAPCD's or any other local air district's similarly structured new source review rule conflicts with the ARB adopted statewide off-road rule. First, the new source review rule is directed at developers of construction projects, not the owners and operators of off-road vehicles. The rule, in effect, allows the developer to choose the means by which it will comply, one of which is a decision that it will use cleaner vehicles in development projects. How the developer chooses to comply is a business decision that it alone will ultimately make. It may choose to pay mitigation fees or pursue various alternatives to reduce emissions from the project, one of which could impose restrictions on the type of vehicles that operate on the project. If it chooses to do the latter and elects to contract with cleaner fleets that is the developer's right. Fleets are not the subject of and are not required to directly comply with SJVAPCD's rule. Second, by complying with the adopted ARB off-

road rule, fleets will be cleaner and more likely to be able to work on development projects in the San Joaquin air basin without raising developers' mitigation fees.

In addition to indirect source rules, local agencies have additional authority to require developers to impose restrictions on off-road vehicles that work on development sites by requiring developers to take mitigation measures under CEQA, if a development project could result in foreseeable adverse environmental impacts. Here again, the mitigation measures that a developer agrees to are effectively voluntary. The developer will ultimately have to decide whether it wants the project to go forward subject to the local agency imposed conditions or not. In turn, the off-road fleets must elect to bid to work on such projects and be willing to operate under the terms set forth in the development's solicitation for work bids.

19)f) Eminent Domain and Legal Challenges

1. **Comment:** Eminent domain is a defense. What else have we got to protect us? The Constitution ensures "just compensation." Where is just compensation? The State is requiring me to give up my equipment because the air is bad. The Constitution guarantees that when 'eminent domain' is used, just compensation is provided to the individual. (CDTOA1) (CBC)
2. **Comment:** Equipment with a usable 30-year lifespan is being deemed unusable in California and must be repowered or replaced in a short timeframe. The billions in cost to repower and replace usable equipment must be financed by the construction companies. Companies purchased the equipment in the first place with the cost-benefit expectation that the equipment would last for decades. (VCE1)
3. **Comment:** Companies typically expect their equipment will last up to 30 years, and they purchase it with the understanding that it will be legal to operate "as built" until the end of its useful life. ARB should not adopt a regulation that would qualify as an unreasonable taking of property. (PILCONIS)(AGCA3)

Agency Response: Contrary to commenters, ARB does not believe that the off-road regulation causes a taking under the Constitution that requires compensation. The off-road regulation does not involve real property that has been deprived of all of its economic uses or value. (*Lucas v. South Carolina Coastal Council* (*Lucas*) (1992), 505 U.S. 1003, 1019, 112 S.Ct. 2886 ["there are good reasons for our frequently expressed belief that when the owner of real property has been called upon to sacrifice all economically beneficial uses in the name of the common good, that is, to leave his property economically idle, he has suffered a taking."].) In so finding, the Court distinguished regulations that affect real property from those affecting personal property, stating:

Where the State seeks to sustain regulation that deprives land of all economically beneficial use, we think it may resist compensation only if the logically antecedent inquiry into the nature of the owner's estate shows that the proscribed use interests were not part of his title to begin with. [footnote omitted] accords, we think, with our "takings" jurisprudence, which has traditionally been guided by the understandings of our citizens regarding the content of, and the State's power over, the "bundle of rights" that they acquire when they obtain title to property. It seems to us that the property owner necessarily expects the uses of his property to be restricted, from time to time, by various measures newly enacted by the State in legitimate exercise of its police powers; "[a]s long recognized, some values are enjoyed under an implied limitation and must yield to the police power." [Pennsylvania Coal Co. v. Mahon, 260 U.S., at 413, 43 S.Ct., at 159.](#) And in the case of personal property, by reason of the State's traditionally high degree of control over commercial dealings, he ought to be aware of the possibility that new regulation might even render his property economically worthless. Lucas, *supra*, 505 U.S. at 1029. [Emphasis added.]

Here, California, exercising its police powers to protect the public's health and welfare, adopted the off-road regulation that affects personal property over which the State has historically regulated. No takings have thus occurred.

4. Comment: Nobody but the lawyers wins in a lawsuit. (CDTOA1)

Agency Response: We agree.

5. Comment: Even if you win the lawsuits, it will delay implementation of the program for years and the benefits of the program will be lost. (CDTOA1)

6. Comment: Lawsuits will be filed due to the inequities, discrimination and safety issues of the regulation. It is easy to foresee injunctions stopping or delaying this program. (DCCI)(BALALA)

Agency Response: For the reasons outlined in the responses to comments in this FSOR, ARB does not believe that the regulation is either inequitable or discriminatory. It further believes that the regulation properly addresses safety issues by making sure that VDECS are not required if unsafe. As described above in our responses to comments regarding CAA preemption, ARB intends to enforce the regulation upon receiving authorization from U.S. EPA, and does not believe that a court will stay implementation or enforcement of the regulation if a legal challenge is filed.

20. Other Issues

20)a) Re-open and Change the Regulation

1. **Comment:** In the past, you have set goals and then changed them. How do the equipment owners know that after they have spent billions of dollars on new equipment, the standards or the approach won't change again, as it has in the past? This is very expensive for us. (CDTOA1)
2. **Comment:** Future changes based on SIP regulations will create problems and hardships unless the ARB regulation is inclusive of future requirements as well as present ones. We are very concerned that we pass a regulation now and that SIP planning then forces that regulation to be readdressed a couple of years down the road because these requirements and targets aren't going to be made. We urge you to come up with a rule now that is going to be a rule forever. (ARA4)

Agency Response: ARB proposed an aggressive off-road diesel regulation that has a timeline that begins prior to the SIP dates in order to accomplish emission and health benefits before 2015, which is a major milestone year for the federally mandated State Implementation Plan (SIP). This regulation achieves emission reductions necessary to meet SIP needs. The regulation also achieves the diesel PM emission reductions determined by the Board necessary to reduce the public health risk posed by the toxic air contaminant. Although the Board always has the ability to modify the regulation, at this time, unless circumstances change, more stringent modifications are not anticipated.

20)b) ARB Not Able to Implement the Regulation

1. **Comment:** There are too many unresolved issues to approve this regulation now. This is the largest in-use regulation ever undertaken by CARB. The experience with the recently approved portable rule has left the construction industry very skeptical that CARB staff is prepared to implement the rule today. (CIAQC7)
2. **Comment:** The regulations are difficult to understand, difficult to implement and poorly communicated. Responsible companies will step up and try to comply and irresponsible companies will evade the issue. A large number of uninformed or under-informed companies will either take incorrect (and expensive) actions, or face stiff penalties. (J&M)
3. **Comment:** The City commends the ARB for planning workshops and training to educate small fleet operators about compliance requirements; the City recommends that ARB extend workshops and training to small, woman-owned, and minority-owned business enterprises, many of which are medium and large fleet operators, and also provide technical assistance (online and by telephone) to all equipment operators. (LACITY)

- 4. Comment:** ARB staff has not responded to the certified letter or e-mail sent to them. With an issue this important I would expect that I would have at least received an e-mail response to the data we have provided. (CAMARILLO5)

Agency Response: ARB has formed a new section specifically to implement the regulation. This section is comprised of additional staff and staff that worked on the development of the regulation. Staff has already updated the fleet average calculator tool for all fleet sizes, and will also be developing additional outreach and training materials, reporting, and compliance planning tools. During the workshop process leading up to the regulation's adoption, several industry stakeholders suggested forming an advisory group after adoption to assist staff with implementation. Staff is in the process of forming an off-road implementation advisory group (ORIAG) which will be an informal committee established by staff to assist with the implementation of the regulation. ORIAG will help fine tune our outreach, training, and implementation strategies and materials and help make staff more aware of the opinions and needs of the affected stakeholders. For a more detailed discussion of ORIAG, please see the discussion in section III-A-16)e) of this FSOR.

We apologize that some of the ARB staff was unresponsive to commenter CAMARILLO5 in reference to a specific letter and email sent to staff. However, we met with Camarillo Engineering (referred to as commenter CAMARILLO5) multiple times throughout the regulation process, and are confident we discussed most, if not all, all of its concerns during these meetings. Additionally, ARB would like to thank Camarillo Engineering, and specifically Dave Porcher, for providing his financial data and other insights to ARB; his regular attendance at workshops and workgroup meetings aided in the development of the regulation.

Lastly, because the regulation would affect so many stakeholders in so many different industries and agencies, and because it affects such a diverse set of vehicles, the regulation was designed to provide maximum flexibility and is therefore by necessity detailed. See **response to section III-A-5)a)** of this FSOR.

The Air Resources Board staff developed this regulation in close coordination with a broad spectrum of stakeholders through public comment periods and a series of public workshops, workgroup meetings, and Board meetings held in several locations. The outreach efforts are discussed in the response in section III-A-16)h) of this FSOR.

20)c) Prohibit Dumping Old Equipment in Rural Counties

- 1. Comment:** Provisions should be included in the regulation to preclude equipment "dumping" in rural areas as some fleet owners seek to sell their dirty units to unsuspecting rural operators. (SVBAPCC)

Agency Response: We disagree that further provisions should be added to restrict the sale of used vehicles in rural areas. The regulation already contains provisions in section 2449(j) that require disclosure of the applicability of the regulation to the buyer of a vehicle. Any person selling a vehicle with an engine subject to this regulation in California must provide the following disclosure in writing to the buyer on the bill of sale:

When operated in California, any off-road diesel vehicle may be subject to the California Air Resources Board In-Use Off-road Diesel Vehicle Regulation. It therefore could be subject to retrofit or accelerated turnover requirements to reduce emissions of air pollutants. For more information, please visit the California Air Resources Board website at
<http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm>.

In addition, in certain rural areas (such as ozone and PM2.5 attainment areas), while the regulation does not require fleets to take actions, such as turnover, repower or retire their vehicles, to reduce their NOx emissions, it does require that these vehicles be retrofit with the highest level VDECS available. As such, even if older vehicles are sold into rural areas from urban areas, the health impacts (such as mortality and cancer risk) of such sales will not be significant.

In all cases, outreach to fleet owners in both rural and urban areas is important to educating all affected parties, including potential buyers of vehicles, of the requirements of the regulation. During the development of the regulation, staff conducted many workgroup meetings and workshops, met with numerous fleet operators (many in rural areas of the state) and sent out hundreds of thousands of mailings to potentially affected parties. Chapter III of the Technical Support Document provides more detail regarding the outreach efforts. Staff will continue such outreach during implementation of the regulation to make as many people aware of the regulation as possible.

20)d) This section intentionally left blank

20)e) ARB Staff Should Help Fleets With Compliance

See section 20)b) above.

20)f) Regulation Will Cause People to Buy New, Rather Than Used Vehicles

- 1. Comment:** Rule will cause people to buy new, rather than used. Buying new rather than “recycling” is environmentally destructive. (CDTOA1)
- 2. Comment:** There are foreseeable environmental consequences associated with regulations. Premature retirement of otherwise functional equipment will force businesses to dispose of that equipment, potentially creating environmental problems. The manufacture of new equipment to

replace currently functioning equipment is also not without environmental consequences. It takes a tremendous amount of energy and natural resources to manufacture heavy equipment and deliver it to an end user. (BCL)

Agency Response: We acknowledge that one option for complying with the NOx provisions of the regulation is upgrading to new vehicles. However, others option are to buy newer, used vehicles or to apply NOx VDECS. As discussed at further length in the responses in section 3)f)i) in Chapter III-A-3 of this FSOR, we expect most fleets will choose the option of upgrading to newer, used vehicles, and the regulation will increase the demand for newer, used vehicles, but will not significantly affect the demand for new vehicles. Encouraging the use of newer, used vehicles is not environmentally destructive, but instead is a form of reusing resources, which is environmentally beneficial.

B. Summary of Comments and Agency Responses – First Notice of Modified Text

A table listing all commenters who submitted comments in response to the first notice is set forth below, identifying the date and form of all comments that were timely submitted. Following the table is a list of those comments that were not pertinent to the regulation, and a list of the comments that were wholly in support of the regulation.

Following those lists is a summary of each pertinent objection or recommendation, together with an agency response providing an explanation of how the proposed action has been changed to accommodate the objection or recommendation or the reasons for making no change. The comments have been grouped by topic whenever possible. Comments not pertinent to the modifications proposed in the first 15-Day Notice are not summarized below. Additionally, any other referenced documents are not summarized below.

Table III-B-1 below lists the comments received during the comment period for the first 15-day Notice.

Table III-B-1 Comments from During the Comment Period for the First 15-day Notice			
Reference Code	Commenter	Affiliation	Date/Time Added to Database
ACI1	Bobo, Harold	ACI	December 20, 2007

Table III-B-1 Comments from During the Comment Period for the First 15-day Notice

Reference Code	Commenter	Affiliation	Date/Time Added to Database
ACI2	Bobo, Harold	ACI	December 20, 2007
AGCA4	ZWEIFEL, DON	Associated General Contractors of America	December 29, 2007
ALBAY	Miles, Gary	Albay Construction Co.	December 28, 2007
ALBRIGHT	Albright, Gregg	Albright, Gregg	January 8, 2008
ANAIR2	Anair, Don	Anair, Don	January 7, 2008
ARA3	McClelland, John	American Rental Association	December 24, 2007
ATA2	Pohle, Timothy	Air Transport Association of America Inc	January 7, 2008
BARLET	Barlet, Ron	Barlet, Ron	January 3, 2008
BERMUDEZ	Bermudez, Deborah	Bermudez, Deborah	December 22, 2007
BERRY	Berry, Mark	Berry, Mark	December 20, 2007
BJK	Kimball, Ben	BJK Construction, Inc.	January 3, 2008
CALPASC2	Wick, Bruce	California Professional Association of Specialty Contractors	December 19, 2007
CEI4	Leslie, Kendal	Coastal Earthmovers Inc.	January 8, 2008
CHAIN2	Chain, Steven	Chain, Steven	January 7, 2008
CIAQC4	Lewis, Michael	Construction Industry Air Quality Coalition	December 13, 2007
CIAQC5	Lewis, Michael	Construction Industry Air Quality Coalition	January 8, 2008
CIAQC9	Lewis, Michael	CIAQC & CBCC	January 8,

Table III-B-1 Comments from During the Comment Period for the First 15-day Notice

Reference Code	Commenter	Affiliation	Date/Time Added to Database
			2008
CIMA	Cartier, Robert	CIMA	January 7, 2008
CPCA	Meiburg, Guenter	California Precast Concrete Association	January 2, 2008
DALEY	Daley, Michael	Daley, Michael	December 26, 2007
DAVISW	Davis, William	Davis, William	January 8, 2008
DAW	Daw Jr., Erbie	Daw Jr., Erbie	January 8, 2008
DER2	Downs, Gordon	Downs Equipment Rentals, Inc.	December 26, 2007
DORAZIO1	Dorazio, Robert	Dorazio, Robert	January 8, 2008
ELLIS	Ellis, Robert	Ellis, Robert	January 3, 2008
ENGEL	Engel, Bob	Engel, Bob	January 8, 2008
EUCA4	McGovern, Tara	Engineering & Utility Contractors Association	December 21, 2007
FCI2	Schmidt, Warren	FCI Constructors, Inc. - Equip. Mgr	December 26, 2007
FISKE	Fiske, Claude	Fiske, Claude	January 8, 2008
GGI	Goodby, Jack	Goodby Grading Inc	December 21, 2007
GSB	Carruthers, Spencer	The Garden Shop at Blairsden, Inc.	January 8, 2008
HARDER1	Harder, Ron	Harder, Ron	December 25, 2007
HARDER2	Harder, Ron	APA	January 8, 2008
HARPER	Harper, Adam	Harper, Adam	January 7, 2008
HAUENSTEIN	Hauenstein, Thomas	Hauenstein, Thomas	January 8, 2008
HAYWARD2	Hayward, Toby	Hayward, Toby	January 7,

Table III-B-1 Comments from During the Comment Period for the First 15-day Notice

Reference Code	Commenter	Affiliation	Date/Time Added to Database
			2008
HC	hartfield, john	hartfield construction	December 28, 2007
HYLAND2	Hyland, Matt	Hyland, Matt	January 8, 2008
JOSPEH	Lawrence, Joseph	Joseph, Lawrence	January 8, 2008
KIP2	Kip, Chris	Kip, Chris	December 27, 2007
KUNZMAN	Kunzman, Lisa	Kunzman, Lisa	January 7, 2008
LACOWORKS	Teebay, Richard	Los Angeles Co. Dept. of Public Works	January 8, 2008
LEWISM1	Lewis, Michael	Lewis, Michael	January 7, 2008
LEWISR	Lewis, Robert	Lewis, Robert	January 8, 2008
LEYDEN	Leyden, Kate	Leyden, Kate	December 28, 2007
MCCARTHY	McCarthy, John	McCarthy, John	January 8, 2008
MURAKAMI	Murakami, Larry	Murakami, Larry	January 7, 2008
NDA2	Taylor, Michael	National Demolition Association	January 4, 2008
NUSS	Nuss, Ron	Equipment Manager	January 3, 2008
NWS2	Thomas, James	Nabors Well Services Co.	January 3, 2008
PCE	German, Scott	PC Exploration, Inc.	January 8, 2008
PFEIFER	Pfeifer, Nick	Pfeifer, Nick	January 8, 2008
PG&E	Wellman, Tyler	Pacific Gas & Electric Company	January 3, 2008
PINETTE2	Pinette, Nicholas	Pinette, Nicholas	January 7, 2008
RATCLIFF	Ratcliff, Philip	Ratcliff, Philip	December 27, 2007

Table III-B-1 Comments from During the Comment Period for the First 15-day Notice

Reference Code	Commenter	Affiliation	Date/Time Added to Database
REI	Walker, Ed	Robinson Enterprises, Inc.	January 8, 2008
RIVERA	Rivera, Leah	Rivera, Leah	December 21, 2007
RLEP	Rathbone, Shelly	Robert L. Ellis Plumbing, Inc	January 3, 2008
ROHMAN	Rohman, Gary	Rohman, Gary	January 8, 2008
RUANE	Ruane, T. Peter	Ruane, T. Peter	January 7, 2008
SCCA4	Torres, Christopher	Southern California Contractors Assoc.	December 21, 2007
SHawe	Shaw, Edward	Shaw, Edward	January 3, 2008
SHAWM2	Shaw, Mike	Shaw, Mike	January 7, 2008
SICILIANI	Siciliani, G.L.	ECA & AGC Member Contractor	December 25, 2007
SIEVERT2	Sievert, Steve	Sievert, Steve	January 8, 2008
STOWE3	Stowe, Gary	Stowe Contracting	January 2, 2008
TORRES	Torres, Chris	Transportation	December 28, 2007
VALENTINE	Valentine, Robert	Valentine Corporation	January 3, 2008
VGC	Hughes, Vince	Vinco General Contractor	January 3, 2008
WCI	Waters, Joyce	Waters Construction, Inc.	January 2, 2008
WELDON1	Birch, Weldon	CMCA, CSDA	January 2, 2008
WELDON2	Birch, Weldon	CMCA, CSDA,	January 8, 2008
WILLERT	Willert, Freddie	Vice President	January 8, 2008

The following Reference Codes pertain to comments that were submitted in response to the first 15day notice but were not pertinent to the first 15-day modifications:

Reference Code
BERRY
EUCA4
SCCA4
GGI
BERMUDEZ
SICILIANI
HARDER1
FCI2
DALEY
RATCLIFF
KIP2
TORRES
HC
ALBAY
LEYDEN
AGCA4
WELDON1
CPCA
WCI
STOWE3
NUSS
PG&E
BJK
BARLET
ELLIS
RLEP
VALENTINE
VGC
SHAWE
NDA2
HAYWARD2
RUANE
SHAWM2
CIMA
PINETTE2
CHAIN2
MURAKAMI
PFEIFER
GSB
PCE
HARDER2
DAW
WELDON2

Reference
Code
FISKE
ROHMAN
ENGEL
DAVISW
DORAZIO1
CIAQC5
LEWISR
HAUENSTEIN
MCCARTHY
WILLERT
CEI4
SIEVERT2
HYLAND2

The following Reference Codes pertain to comments submitted in support of the 1st 15-day modifications to the regulation:

Reference
Code
ANAIR2
ALBRIGHT

1. Chapter 1

1)a) Applicability: Should Allow Sub-fleets to Comply Only with PM Provisions, Change Captive Attainment Area Definition

- Comment:** As an association that represents the mineral industry, we have a number of members whose fleets primarily reside at stationary facilities within attainment air basins. However, having only a few pieces of equipment at another facility in a non-attainment air district forces them to treat their entire fleet as if it resides within a non-attainment air basin. We believe this is not only inherently unfair on these fleets but also undesirable considering the expected limitations on availability of retrofit and repower technology.

Should you adopt the rule in this manner you will force fleets that are primarily located in attainment air basins to compete for limited technology with fleets in non-attainment air districts. In effect, should the fleet primarily residing in an attainment basin place their orders first they could well end up taking the engines and new equipment necessary for reductions in nonattainment air basins. The fleets in the non-attainment basins could still be in compliance with the rule should they simply have placed their order at least 6 months prior to their compliance date.

The division of this rule into a NOx or PM compliance path creates the flexibility for CARB to provide this compliance option to operators. The tracking of compliance could still be easily verified by the reporting and labeling requirements of the rule, and providing such flexibility would ensure that technology necessary for non compliant air districts went to those districts while PM retrofit technology is implemented statewide.

As an industry that primarily operates stationary fleets, sometimes at multiple locations within the state, adopting changes that reflect the NOx requirements do not apply to equipment operate only in attainment air basins would be very helpful. (HARPER)

Agency Response: We agree that an identified portion of a fleet which operates only in air districts that currently meet all federal air quality standards and that are not upwind contributors to downwind ozone violations should not be required to comply with the regulation's NOx provisions. As such, we modified the section 2449(c)(6) definition of captive attainment area fleet to make this change in the Third Notice of Public Availability of Modified Text and Availability of Additional Documents, which was made public on March 5, 2008. A fleet may identify a portion of its vehicles as operating inside an attainment area, and be exempt from the NOx requirements for the identified portion. The fleet will be responsible for reporting that portion's emissions information separately from the parent fleet. Per section 2449(d), in order to be considered a fleet portion, the various portions of a fleet must be under the control of different responsible officials because they are part of different subsidiaries, divisions, or other organizational structures of a company or agency. However, the compliance dates that each fleet portion must meet are still defined based on the total horsepower of the fleet (the sum of the individual fleet portions).

1)b) Define Rounding Procedure

- 1. Comment:** Regarding the NOx Performance Requirements in section 2449.1 of the regulation: There is still no procedure for handling numerical roundoff when deciding whether a fleet compiles or not. (ARA3)

Agency Response: To keep the regulatory language as brief and simple as possible, ARB did not include specifics on rounding procedures for the fleet average indices and targets in the regulatory language, believing that such direction was unnecessary since it intends to adhere to the standard mathematical method for rounding, also known as conventional rounding. See response in section III-A-6)b)ix) of this FSOR for further description of this method of rounding. To the extent that any stakeholder is not familiar with the conventional methods of rounding, ARB will explain the method in implementation guidance that it will be issuing and in other outreach efforts.

1)c) Exempt PM Attainment Areas from PM Requirements

- 1. Comment:** Areas that are in attainment for the federal PM2.5 air quality standard should be exempt from the PM requirements. The regulation already exempts “Captive Attainment Area Fleets” from the NOx requirements. State law requires ARB to consider alternatives which include geographically limited and basin-specific standards. Any geographic or pollutant-specific limitation would help focus limited resources, such as manufacturing, retrofitting, repowering capacity, and public financing to areas that most need those resources. (JOSEPH)

Agency Response: We disagree. Although diesel particulate matter emissions do contribute to ambient concentrations of fine particulate matter (PM2.5), the primary driver for the diesel PM requirements is not the need to attain the federal PM2.5 ambient air quality standard, but instead the need to reduce the public's exposure to the toxic effects of diesel PM. Exposure to diesel PM occurs wherever diesel vehicles are being used regardless of whether the area in which the vehicle is being used attains federal air quality standards or not. Chapter II, Section B of the Staff Report discusses further how diesel PM was identified as a toxic air contaminant and how the Diesel Risk Reduction Plan adopted in 2000 directed ARB to reduce emissions of diesel PM throughout the state.

1)d) Applicability: Clarify Who is Responsible for Contractor Units

- 1. Comment:** Some government agencies have off-road diesel vehicles that are maintained and operated by a contractor. The vehicles are not under the direct control of that agency. It is not clear in the regulation whether the government agency or the agency's contractor is responsible for reporting these vehicles and ensuring their compliance. (LACOWORKS)

Agency Response: The responsibility for vehicles falls on the vehicles' owner, not the operator. The only exception to this is for rental vehicles leased for a period of one year or more, as described in section 2449 (c) (24). Thus, in the situation described by the commenter, if the vehicles are owned by the government agency, the government agency has responsibility for reporting them and ensuring they comply with the regulation.

This is clear in the regulation because all performance requirements are for fleets and fleets are defined in 2449(c)(23) as “all off-road vehicles and engines owned by a person, business, or government agency that are operated within California and are subject to the regulation.”

1)e) Define the Term “years old”

- 1. Comment:** The term “years old” requires a definition. (ARA3)

Agency Response: We disagree. To keep the regulatory language brief and as simple as possible, staff did not define commonly used terms such as “years old.”

Staff can provide clarification on such terms if necessary in the informal guidance materials developed during implementation.

1)f) Clarify if Low-use Vehicles are Included in Fleet Size

1. **Comment:** ARB staff needs to clarify whether the horsepower from low usage (e.g., less than 100 hours of usage per year) units should be included or excluded for the purposes of calculating the fleet size. (LACOWORKS)

Agency Response: As described in section 2449(c)(25) in the definition of fleet size category, “Low-use vehicles, dedicated snow-removal vehicles, and vehicles used solely for emergency operations need not be included in the total maximum power used to classify fleets by size.”

1)g) Clarify Definition of a “new fleet”

1. **Comment:** New fleets must meet the regulation’s fleet average requirements immediately. New fleets need to be defined. If one firm from outside of California buys out or acquires the assets of another firm, are they considered a “new fleet”? If so, many firms have to close their doors because selling the firm and its assets may not be in the acquiring firm’s best interests. (LACOWORKS)

Agency Response: The regulation already contains provision addressing the commenter’s concerns. A firm outside of California that did not already possess a California fleet can acquire a California fleet without having to meet the fleet average requirements immediately. As stated in section 2449(d)(6), “Fleet Ownership Transferred, that is, transfer of ownership to a new owner who did not own a fleet before does not automatically require the fleet to begin meeting the fleet average requirements in sections 2449.1(a)(1) and 2449.2(a)(1).” New fleet is already defined in the regulation language as follows: “New fleet means a fleet that is acquired or that enters California after March 1, 2009. Such fleets may include new businesses or out-of-state businesses that bring vehicles into California for the first time after March 1, 2009.”

1)h) Give PM Credit for Retirement of Tier 0 Vehicles

1. **Comment:** The regulatory language should include more PM credit for early retirement of Tier 0 vehicles. Also, early credits should be allowed for retirement of Tier 0 equipment for both NOx and PM. If NOx credit is given for retirement of equipment, if the equipment is retired between March 1, 2006 and March 1, 2009, why not give PM credit for the same period? If PM credit is given for early retrofits from March 1, 2009 until February 29, 2012, why not give the same type of credit for early retirement of Tier 0 equipment? Fleet owners who opt to help clean up the air early, and help to contribute to fewer emissions, should be able to get some type of benefit. (ACI1)

Agency Response: We disagree that these additional credits are needed. In addition to granting early NOx credit in the form of carryover turnover credit, the regulation already provides a benefit towards the PM requirements for fleets that retire Tier 0 vehicles early because retiring Tier 0 vehicles will lower a fleet's PM fleet average. This means that such a fleet will be closer to meeting their PM fleet average targets, thereby potentially reducing the number of PM retrofit required under the BACT provisions. Also, staff does not believe that additional credit should be given for early retirement of Tier 0 vehicles (i.e., in the form of carryover retrofit credit) because this would reduce the emission reductions achieved by the regulation (i.e., would allow fleets to delay installation of highest level VDECS).

On a related note, in the first Notice of Public Availability of Modified Text and Availability of Additional Documents released on December 11, 2007, staff added a provision at section 2449.2(a)(2)(A)1.b. that allows fleets that are reducing their total horsepower to claim credit toward the PM requirements for Tier 0 vehicles that are retired.

1)i) Credit for Alternative Fuel Conversions

- Comment:** Why does the regulation treat alternative fuel conversions differently than alternative fuel vehicle replacements? For alternative fuel conversions, the NOx factor of the original vehicle must be used. For replacements with alternative fuel vehicles, the emission factor to which the alternative fuel vehicle is certified may be used. (ARA3)

Agency Response: Alternative fuel conversions are treated differently in the regulation because alternative fuel conversions are not certified to an engine NOx standard. A fleet owner must use the NOx factor of the original vehicle when converting the vehicle to alternative fuel because there is no certified NOx standard to use. In contrast, when a diesel vehicle is replaced with an alternative fuel vehicle, it is typically being replaced with a vehicle that is certified to an emission standard. In this case, as stated in section 2449 (d)(1)(A)4, “....each alternative fuel vehicle should use an Emission Factor equal to the emission standard to which its engine is certified in g/bhp-hr. If the alternative fuel vehicle is not certified to a NOx or diesel PM emission standard, the owner may apply to the Executive Officer to use an appropriate emission factor. In the application, the owner must, as demonstrated that the chosen emission factor is appropriate and not exceeded by the alternative fuel vehicle.”

1)j) Allow Reuse of VDECS if Vehicle is Retired or Sold Outside of State.

- Comment:** It is necessary to allow operators to move VDECS between equipment upon the retirement of a piece of equipment or when the equipment is sold outside of the State. There is no reason to force operators to dispose of perfectly good VDECS in the situation where the

equipment on which the VDECS was originally installed will no longer be in the State. (HARPER)

Agency Response: We agree. As stated in section 2449(d)(9), VDECS are required to be kept on vehicles operating in California and maintained until the VDECS fails or is damaged. However, it was not staff's intent and the regulation does not require that VDECS must be kept on vehicles that are no longer operating in California. Section 2449.2(a)(2) states that reusing a VDECS can count toward the retrofit requirements if the vehicle it was taken from is no longer operating in California, i.e., "If the VDECS is not new (i.e., is being reused), it must have been taken from a vehicle that is no longer operating in California."

1)k) VDECS That Violate Mine Safety Rules

1. **Comment:** In the section on "VDECS that impairs safe operation of vehicle", ARB staff should include language that includes MSHA along with CalOSHA as the former also inspects many operations throughout California. (REI)

Agency Response: We agree. In the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, we modified section 2449(e)(8) by adding an additional factor that can cause a VDECS not to be considered highest level VDECS, i.e., if use of the VDECS would conflict with state or federal mine safety and health requirements.

1)l) Do Not Add Reporting in 2012 for Medium Fleets and 2014 for Small Fleets

1. **Comment:** The modification relative to moving the reporting years up for medium and small fleets ("(25) Changing the initial annual reporting year for medium fleets to 2012 instead of 2013 and for small fleets to 2014 instead of 2015 (section 2449(g)(2)).") should not be made. Moving the reporting years forward will make compliance with the regulation even more difficult for small and medium fleets. The reporting requirements impose too great an administrative burden for small and medium fleets. (CALPASC2) (RIVERA) (ARA3)

Agency Response: The modification to have medium fleets report in 2012 and small fleets report in 2014 is necessary in order to show required annual percent turnover or percent retrofit by 2013 and 2015, respectively. We also believe reporting one year earlier imposes a relatively small burden on small and medium fleets, and that the reporting requirements in the regulation are needed to accomplish the purposes of the regulation.

As described in Chapter X of the Technical Support Document, staff included costs for recordkeeping and reporting in the cost analysis for the rulemaking.

See also the responses in section III-A-6)b)iv of this FSOR for a discussion of the special provisions the regulation already contains to make compliance for small and medium fleets easier (i.e., delayed compliance, etc.)

1)m) Do Not Add Reporting in 2021 for Large and Medium Fleets and 2026 for Small Fleets

1. **Comment:** We oppose modification, “26) Changing the final annual reporting year for large and medium fleets to 2021 instead of 2020 and for small fleets to 2026 instead of 2025 (section 2449(g)(2)).” There is no justification given for all construction firms to have an additional year of compliance activities. Additionally, this change is going to be very expensive and difficult to comply with. (CALPASC2) (RIVERA)

Agency Response: We disagree. In order to show compliance with the final target date requirements in section 2449(d)(10), it is necessary to require reporting in 2021 for large and medium fleets and 2026 for small fleets. We also believe reporting for one additional year imposes only a minor burden on fleets.

1)n) Requiring Medium and Small Fleets to Report Fleet Changes Between 2010 and the First Annual Reporting Date

1. **Comment:** We oppose modification 29 which requires medium and small fleets to report fleet changes between 2010 and the first annual reporting date (section 2449(g)(4)). It imposes too high of an administrative burden on small and medium fleets. (CALPASC2) (ARA3)

Agency Response: We agree. In the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, we removed this requirement.

1)o) Report if a Fleet is a Captive Fleet in an Attainment County

1. **Comment:** Reporting requirements in section 2449 (g) should include whether a captive fleet is in an attainment county. (ARA3)

Agency Response: We agree. In the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, we added a requirement to section 2449(g)(1)(A)16 for fleets to report whether they are Captive Attainment Area Fleets. This is necessary because requirements for captive attainment area fleets differ from those of other fleets.

1)p) Define First and Final Compliance Dates

1. **Comment:** In section 2449 (g), the first and final compliance dates are not defined. There needs to be a section that specifically spells out compliance dates based on fleet size. (ARA3)

Agency Response: We disagree. Compliance dates are already set forth in Tables 1, 2, and 3 of the regulation. The dates are March 1, 2010 through March 1, 2020 for large fleets, March 1, 2013 through March 1, 2020 for medium fleets, and March 1, 2015 through March 1, 2025 for small fleets.

1)q) The 1.18 Factor Applied in Calculating Fleet Average Emissions Under the Activity-weighted Compliance Option Should Not be Adopted

1. **Comment:** The hours in fleet average formula should not use the 1.18 factor to adjust up calculated indices. Limiting the use of older equipment constitutes an economically viable approach for some equipment owners, and the 1.18 factor will reduce the viability of this approach. (ARA3)

Agency Response: We disagree. Section 2449(d)(2) of the regulation contains the Hours in Fleet Average Option, which states:

As an alternative to the formulas for calculating NOx index and diesel PM index in sections 2449.1(a)(1) and 2449.2(a)(1), fleet owners may opt to include annual hours of operation for all engines in the fleet on the compliance date in the calculation as follows:

NOx Index = 1.18 times [SUM of (Max Hp for each engine in fleet on compliance date multiplied by NOx Emission Factor for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)] divided by [SUM of (Max Hp for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)]]

Diesel PM Index = 1.18 times [SUM of (Max Hp for each engine in fleet on compliance date multiplied by PM Emission Factor for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)] divided by [SUM of (Max Hp for each engine in fleet on compliance date multiplied by Annual Hours of Operation for each engine in fleet on compliance date since the previous year's compliance date)]]

Older vehicles are generally used less than newer, so a typical fleet would have lower indices using the hours in fleet average formula than with the regular formulas in sections 2449.1(a)(1) and 2449.2(a)(1) if the 1.18 factor were not included. In order to preserve the emission benefits of the rule, the index using hours had to be scaled up. If you took all the fleets and figured their fleet index with the hours option and without it, the indices with the hours option would be lower than without by about a factor of 1.18. Therefore, we included the 1.18 factor to ensure the stringency of the regulation is equivalent when using the hours in fleet average option to when using the regular formulas.

The hours in fleet average option is an option meant to provide additional flexibility to fleets, and whether to use it or not is up to affected fleets. If the inclusion of the 1.18 factor makes the hours in fleet average option unattractive, fleets may choose not to use it.

1)r) Bifurcation of Regulation into NOx and PM Portions

- 1. Comments:** Separating the NOx and PM portions of the rule to facilitate other states' adoption of portions of the off-road diesel rule, ARB reduced the availability of high-tier used equipment by increasing the number of buyers for, and decreasing the number of sellers of, high-tier used equipment in other states that will opt into the CA program. (CIAQC4)
- 2. Comments:** Bifurcating the regulation will facilitate other states' opting in, and – when they do – there will be greater competition for clean, used vehicles, thereby increasing the cost of the regulation. Bifurcating the NOx and PM standards makes it easier and more attractive for other states to opt into their desired portion of the ORD rule (e.g., the NOx requirements for ozone nonattainment areas) under Clean Air Act §209(e)(2)(B). By opting into the ORD rule, other states will increase the number of buyers of later-tier used equipment and decrease the number of sellers of such equipment, thereby driving up the cost of the ORD rule, impairing its feasibility for the California construction industry, and decreasing the ORD rule's cost effectiveness.

ARB should re-assess the market in used equipment, in light of the decision to bifurcate the NOx and PM requirements. Specifically, other opt-in states such as New York or Texas will go from suppliers (i.e., sellers) to demanders (i.e., buyers) of higher-tier used equipment and the limited supply of new equipment needed to comply with the ORD rule's fleet-average requirements. By creating competitors for the purchase of the lower emitting equipment that the ORD rule requires, ARB will drive up the cost of compliance. For that reason, ARB's adoption of the bifurcated NOx-PM alternative requires that ARB revisit its economic analysis. (JOSEPH)

Agency Response: The Board debated whether or not to bifurcate the rule into NOx and PM portions at the July 26, 2007, board meeting and directed staff to do so. Therefore, in the First Notice of Public Availability of Modified Text and Availability of Additional Documents, staff followed the Board's direction and put the NOx requirements in section 2449.1 and those for diesel PM in section 2449.2.

Whether other states choose to adopt all or part of the in-use off-road diesel vehicle regulation is speculative. It is not possible for staff to predict the possible future actions of other government agencies in other states and take those into

account in our economic analyses. To do so would require a crystal ball we do not have.

Please see the response in section III-A-2)g) of this FSOR for a discussion of why we believe there will be an adequate supply of used vehicles to satisfy the demands of the regulation.

1)s) Multi-year Targets

- 1. Comments:** ARB considered multi-year alternatives based on unsupported data and patently incorrect assumptions. For interim years, without citing data or other support, staff simply assumed that the alternatives would always achieve a certain percentage lower emissions reductions in interim years than the staff's proposal. For example, ARB assumed that emissions benefits in certain interim years would be only 20 percent or 40 percent of the amount targeted under the ORD Rule as contemplated by ARB. There is absolutely no support in the rulemaking record for ARB's selection of these figures. (ATA2)

Agency Response: We disagree. As discussed in "Attachment 3 ~ Analysis of Alternatives to the Proposed In-Use Off-road Diesel Vehicle Regulation Discussed at the July 26, 2007 Board Meeting" to the First Notice of Public Availability of Modified Text and Availability of Additional Documents, Mr. Michael Lewis, Senior Vice President of CIAQC, proposed CIAQC's multiyear proposal that would have contained targets only every three years, instead of every year as in the regulation. The CIAQC multi-year proposal required showing of 20 percent and 40 percent compliance in the first and second year respectively of CIAQC's alternative multi-year proposal. That proposal was the source of the 20 and 40 percent used in the analysis. Just as there would be little justification for assuming that reductions would exceed those required by the rule, there is little justification for assuming that the CIAQC proposal would achieve reductions beyond those that are required, i.e. the compliance targets.

More generally, as discussed in the response in section III-A-8)d)ii) of this FSOR, it is not unreasonable to expect that fleet owners, if given the option of meeting targets over a three-year period would attempt to gain the maximum possible economic advantage by delaying compliance to very last possible moment. Therefore, a conservative estimate of the reductions to be gained from either the rule or any alternative proposal should not include reductions associated with actions that a fleet owner would not normally take in the course of business or to meet the minimum requirements imposed upon them by a rule. Consequently, any multi-year alternative that does not have targets equal to or exceeding those of the adopted regulation should reasonably be expected to achieve fewer emission reduction benefits compared to the regulation.

- 2. Comment:** Most egregiously, Staff assumed that under a three-year alternative, in every interim year when the next compliance date is two

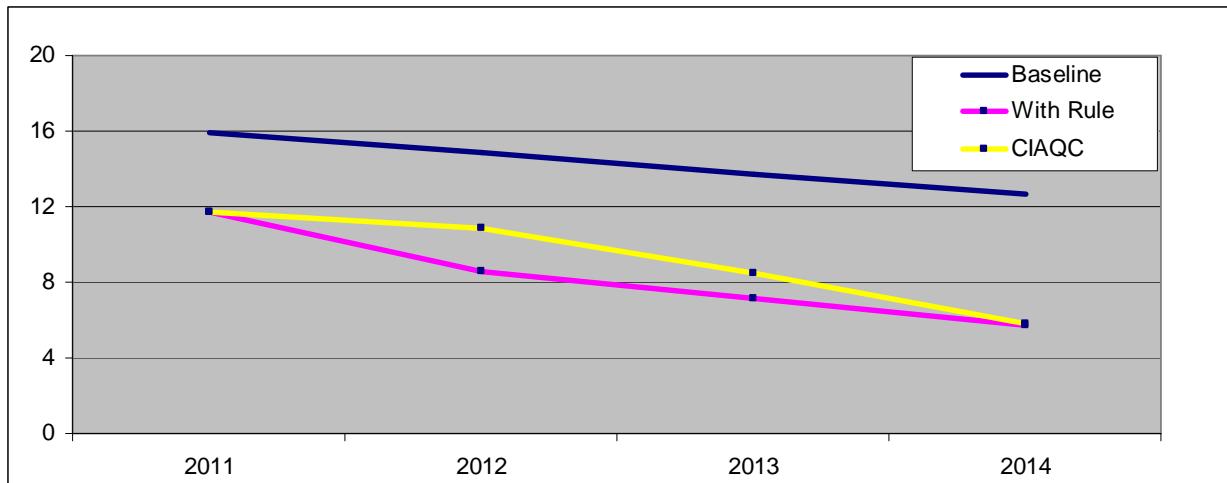
years away, the fleets emissions would increase. Staff cited no support for this assumption, which is absurd for a number of reasons. First, newer, cleaner vehicles replace older, dirtier vehicles. Second, staff ignored rule provisions that would prohibit fleets from adding dirtier vehicles. Finally, no rational fleet owner would scrap newer, retrofitted vehicles for older, dirtier vehicles. (ATA2)

Agency Response: We disagree. It appears that the commenter has confused “emissions increases” with the loss of emissions reductions benefits, the former of which is an absolute amount, the latter, a relative difference. From that confusion, the commenter may have inferred that staff replaced newer vehicles with older vehicles (as noted in the third bullet in comment ATA2 above). Staff have never modeled older vehicles replacing newer vehicles.

As discussed in Chapter VI of the Staff Report, the statewide NOx and PM emissions inventory is expected to decrease over time due to natural turnover. As shown in Figures VI-1 and VI-2 in the Staff Report, the regulation will increase the rate of turnover and create additional emissions reduction benefits. The emissions inventory is an absolute amount; whereas, the emissions reductions benefits are the relative difference between the emissions expected under normal turnover and those expected if the regulation is implemented.

To clarify the commenter’s confusion, consider the years between 2011 and 2014. As shown in Figure III-B-1(s)-1, the total statewide PM emissions are expected to decrease naturally, with the regulation, and under the CIAQC proposal. However, as discussed in the responses to Comment 1 immediately above and in section III-A-8(d)ii) of this FSOR, the assumption used in estimating the emissions from the regulation and in the analyses of alternatives is that a fleet owner will not do more than they normally do if there is no requirement to do so. Therefore, in the CIAQC alternative, emissions stay constant from 2011 to 2012 (i.e., do not increase or decrease).

Figure III-B-1(s)-1 – Statewide PM Emissions Inventory With and Without Rule and CIAQC for Years 2011 Through 2014 (tons per day)



As shown in III-B-1)s)-2), (excerpted from Appendix 1 of the Attachment) since the absolute emissions under the CIAQC alternative do not decrease as quickly as the natural turnover, the emissions benefits of the CIAQC proposal decrease during the interim years.

Table III-B-1)s)-2) Emission Benefits under ARB vs. CIAQC Proposal

Calendar Year	PM benefits from ARB Proposal	CIAQC 3-yr Targets, 20%/40%
2011	4.17	4.17
2012	6.20	3.97
2013	6.50	5.23
2014	6.81	6.81

Thus staff did not:

- Model replacing newer, cleaner vehicles with older, dirtier vehicles.
- Ignore rule provisions that would prohibit fleets from adding dirtier vehicles.
- Model fleet owners scrapping newer, retrofitted vehicles for older, dirtier vehicles.
- Estimate that fleet emissions would increase over time for any of the alternatives.

We believe the estimated emission reductions for the rule and the various alternatives are reasonable and indicative of the relative benefits associated with each.

1)t) Economic Hardship Provisions

- 1. Comment:** The regulation should have provisions for economic hardship or slowdown. It is impossible to predict the amount of repowers, replacements, and retrofits a company could afford for the next year at the beginning of the current year. After the regulation goes into effect, it will create severe financial unpredictability unless the ARB staff can advise with certainty a year in advance on the economy. All of the heavy equipment rental companies I am familiar with have had revenue reductions of 25% to 50% in 2007. Yet, there is NO provision in the rule for economic slow down or economic hardship! The CARB makes NO provision for the fact that Off-road diesel engines have burned 25% to 50% less diesel in 2007 and therefore produced correspondingly less NOx and PM. The 25% to 50% reduction in emissions should be credited as a delay in the implementation date of the Regulation of at least one year to allow time for the economy to rebound. (DER2)

Agency Response: While the commenter is correct in that the regulation does not contain specific provisions (such as a suspension of the regulation or lesser regulatory requirements) to address economic slow down or hardship, it does contain a number of provisions that will reduce the economic impact during economic downturns. First, the fleet averaging provisions allow a fleet to take hours of use into consideration when calculating their fleet average, thereby allowing them to prioritize their compliance on their vehicles that are being used the most. Also, fleets can take advantage of the low-use provisions, thereby not having to count the horsepower of that vehicle in their fleet average calculation. Fleets may permanently designate vehicles as low use, which is equivalent to turning over that vehicle. Fleets also have the option to retire vehicles. Staff believes all of these provisions offer fleets a variety of compliance options during economic downturns.

At the July 2007 Board hearing, the Board directed staff to add further provisions that allow PM credit for retirement of Tier 0 vehicles for fleets that are reducing horsepower. This provision provides an additional measure of relief to companies that may be hit by financial hardship during an economic slowdown. The changes were made available as part of the first Notice of Public Availability of Modified Text and Availability of Additional Documents.

The commenter also mentions the difficulty of predicting a year in advance a company's ability to pay for the required accelerated turnover, repowers, and retrofits. Staff believes that having to budget funds for compliance, and setting these funds aside for future use is no different from what they already would have to do for any other purchase they need to make during the year.

Finally, staff recognizes that compliance with the regulation will be financially challenging for some fleets and that some will need to pass compliance costs on

to their customers. The reasons that staff believes the regulation will be affordable are discussed in the responses in section III-A-3)a) of this FSOR.

1)u) Compliance Extension for Equipment Manufacturer Delays Should Include More Detail

1. **Comment:** Section 2449(e)(6) of the regulation should include dates for which an extension due to equipment manufacturer delays can be granted. (ARA3)

Agency Response: We disagree. To keep the regulatory language as brief and simple as possible, staff did not include all such dates. Staff can provide such dates in the informal guidance materials that we will be developing during implementation of the regulation.

1)v) Appeals: Owner Should be Able to Proceed As if Appeal Has Been Granted

1. **Comment:** Section 2449(e)(8)(a) on appeals should include a statement that allows equipment under appeal to be allowed to remain legally in service until the appeal process is completed and a final decision is made. The owner should be assumed innocent until proven guilty. (ARA3)

Agency Response: We recognize the need for fleet owner's in the process of appealing safety findings to have certainty during the appeal process. We therefore added the following language in Section 2449(e)(8)(a) in the second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008: "During the appeal process described in (A) and (B) below, the requesting party may request the administrative law judge to stay compliance until a final decision is issued. If the stay is granted and the Executive Officer denies the requesting party's request, the requesting party has six months from the date of the Executive Officer's final written decision to bring his or her fleet back into compliance."

1)w) Clarify if fleet re-computes PM average after turnover

1. **Comment:** In Section 2449.2 under the PM BACT requirements, the requirement for PM BACT needs to be clarified. If a fleet fails both the NOx and PM average and therefore, turns over vehicles, does it then recompute its PM average to determine compliance with the PM part of the regulation? (ARA3)

Agency Response: Yes, the PM average is recalculated when vehicles are turned over. We do not believe a change is necessary in the regulatory language because we think the process is sufficiently clear. The following flow chart (from page 72 of the Technical Support Document and used in numerous workshops) shows the process. Staff can reinforce this point if necessary in the guidance that it plans to develop to assist with implementation of the regulation.

1)x) Allow more time to request a hearing

1. **Comment:** The regulation needs to allow more time for fleets to request a hearing to appeal the Executive Officer's finding that a VDECS can be installed safely. Section 2449(e)(8)(A)(2) states, "A request for a hearing shall be filed within 20 days from the date of issuance of the notice of the denial." Section 2449(e)(8)(A)(15) states, "The Executive Officer shall render a final written decision within 60 working days of the last day of hearing." We recommend the Board change the regulation from 20 days to 60 working days for fleet owners. (NWS2)

Agency Response: We agree that a requestor might need more time to decide whether to request a hearing. Therefore, in the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, we extended the time allowed for fleets that wish to appeal the Executive Officer's finding that a VDECS can be installed safely from 20 to 30 days to allow more time for fleets to consult with retrofit device manufacturers, gather relevant data, and prepare their appeal. The revised regulatory language now states, "A request for a hearing shall be filed within 30 days from the date of issuance of the notice of the denial." We believe this change gives fleet owners sufficient time to make this decision.

1)y) Compliance extension for manufacture delays should be extended

1. **Comment:** Section 2449(e)(6) allows for a compliance extension for equipment manufacturer delays if the fleet owner has entered into a contractual agreement at least six months prior to the compliance date. A more reasonable requirement would be to have the fleet owner enter into a contractual agreement by at least the compliance date, in lieu of six months prior. The increased workload needed to comply with this regulation (purchase of an estimated 33 different types of off-road equipment and over 212 retrofits for 2010) in addition to increased workload to comply with other state air quality mandates simultaneously, all without additional staff, is a hardship on Caltrans. Extending the purchase order date 6-months will help us without hurting our ability to achieve emission reductions. (KUNZMAN)

Agency Response: In the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, staff provided fleet owners two more months to enter into a purchase contract for equipment and vehicles and still be able to qualify for the compliance extension for equipment manufacturer delays. The extension only applies to equipment and vehicles for which the fleet owner entered into a purchase contract at least four rather than six months prior to the compliance date. This is to address concerns that some agencies may not have their budgets approved in time to be able to purchase equipment and vehicles six months ahead of compliance dates.

We do not agree with the commenter that fleets should be allowed to order equipment or vehicles up to the compliance date (i.e., the date the regulation requires the vehicle or retrofit to be in place) because we are concerned that many fleets might wait until the compliance deadline to submit their orders, and would not actually achieve compliance by the compliance date.

1)z) EO approval should be presumed granted

- Comment:** Any significant delay by the Executive Officer in approving a request for credits for electric replacements may further complicate compliance planning or put a fleet in technical non-compliance pending an Executive Officer approval that should be granted. The regulation should be revised to provide that if no Executive Officer resolution is issued within a certain time period after a request for approval is submitted (e.g., 20 days), the fleet may rely on the credit as though it had been granted. If the Executive Officer later decides to deny the credit request, the fleet should be given additional time to achieve compliance. (ATA2)

Agency Response: We disagree. The EO will respond to such requests in as timely a manner as possible, and fleets should make requests to the EO early enough to avoid the potential problem raised by the commenter.

The requirement for EO approval is necessary to ensure appropriate credit is given in the regulation for electric vehicle additions and stationary or portable systems used to replace diesel vehicles. We do not agree that the regulation should be amended to allow de facto approval after 20 days because that would imply that approval should be assumed in some cases when it is inappropriate (for example, when a fleet has proposed using an inappropriately large horsepower or when a fleet tries to take credit for a system that did not actually replace a diesel vehicle). This would undermine the effectiveness of the regulation

1)aa) Add clarification regarding what to do if engine data is unknown

- Comment:** The regulation needs to have more detail regarding engines for which the model year cannot be determined. Currently the text in the regulation states: "If engine data required to be reported is unknown, such engines are assumed to be 1900-1969 vehicles for fleet average purposes." Under this rule, treating a newer engine as a 1969 model engine just because of missing engine data could have huge implications to an equipment owner. It is not uncommon for an engine to be missing an identification plate, or to have a plate that is only partially legible, primarily as a consequence of undergoing rebuilds. Even if these numbers are missing an engine manufacturer can generally bracket the range of years an engine was made, if not identify the exact year, by looking at the engine's build and components. The commenter suggests the following text in the regulation: "If a manufacturer can only bracket the

model year of the engine (for example, that an engine was built between 1987 and 1994) the earliest date the engine was manufactured shall be used for the model year of that engine (in the example, 1987)." (CIAQC9)

Agency Response: We agree. In the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on February 5, 2008, we added more detail regarding engines for which the model year cannot be determined, and modified the introductory language in Appendix A to read as follows, "If the model year of an engine is unknown because it is missing a serial number, manufacturer's build code, and/or an engine family number, and the engine manufacturer or authorized representative is unable to determine the model year of the engine by examining the engine's build and components, such an engine shall be treated as a 1969 model year engine. If a manufacturer can bracket the model year of an engine (for example that an engine was built between 1987 and 1994) by examining the engine's build and components, the earliest date the engine could have been manufactured shall be used as the model year of that engine (in the example, 1987)."

2. Chapter 2

2)a) Safety procedure

1. **Comment:** The regulation's BACT VDECS exemption inappropriately places burden of proof to demonstrate lack of safety on GSE operators. The regulation now provides that a VDECS will not be required under the BACT provisions for a particular vehicle if the manufacturer of the VDECS unit states to ARB that there is "no safe or appropriate method of mounting its VDECS" on the vehicle. Absent such a declaration by the manufacturer, a party must provide evidence, such as "published" reports or findings of government agencies, independent testing laboratories, "or other equally reliable sources" demonstrating that the unit cannot be safely installed or operated.

This provision is fundamentally flawed and contrary to federal law with respect to GSE. As a practical matter, a VDECS manufacturer wishing to increase sales would be very unlikely to volunteer that there is "no safe or appropriate" way to install its product - particularly since this standard includes no consideration of the cost or disruption required to achieve VDECS mounting. Accordingly, the burden shifts to GSE operators to prove a lack of safety, under circumstances where ARB might presume that the manufacturer refused to make such a statement.

However, in the field of aviation, which is regulated exclusively at the federal level to ensure the safety and efficiency of the National Airspace System, this turns the appropriate burden for safety on its head. No GSE or other equipment can be mandated for airport operation unless and until it has been tested and proved safe for airport operations. In the absence

of evidence or findings from a governmental agency or independent testing laboratory concerning the safety of a GSE retrofit device for airport operations, the presumption must be that the device should not be required unless and until proven safe. Any state regulation that impairs the safe and efficient operation of the National Airspace System, or impacts the movement and operation of aircraft, is federally preempted (ATA2)

Agency Response: As stated in section 19) of this FSOR, the scope of preemption of the federal aviation acts (e.g., the Federal Aviation Act of 1958 (FAA) or the Airline Deregulation Act of 1976) and the authority granted to California under the federal Clean Air Act (CAA) to regulate nonroad GSE equipment has as yet been addressed by the courts. As stated, ARB believes that courts will attempt to harmonize the several federal acts.

Commenter ATA2 attempts to paint preemption with a broad brush. While ARB acknowledges that 49 U.S.C. § 47101(a)(1) does provide that “safe operation of the airport and airway system is the highest aviation priority,” the commenter fails to specifically cite to any section that supports its proposition that “[n]o GSE or other equipment can be mandated for airport operation unless and until it has been tested and proved safe for airport operations.” Not finding such an express prohibition, the off-road regulation, as adopted, reasonably sets forth a process that harmonizes federal aviation needs for safety and the CAA requirements mandating cleaner air. The regulation establishes a process that ensures safe and proper operation of GSE fleets and that airport and airway safety, in general, will not be jeopardized.

As part of the ARB verification process, the VDECS manufacturer must provide a complete discussion of possible safety issues resulting from the installation of the VDECS on an engine for which it is verified to operate. The VDECS manufacturers must also warranty the VDECS itself defects and improper performance as well as warranty the engine for any damage to the engine caused by the VDECS. (Title 13, CCR, § 2707.) Whereas the possible interactions of the VDECS and engine to which it has been verified are somewhat limited and can be reasonably ascertained by the VDECS manufacturer, the installation of VDECS on a particular type of vehicle and the safety issues that may arise as a result can best be determined by the fleet owner, the installer, and the VDECS manufacturer in tandem. The fleet owner, in coordination with the installer and VDECS manufacturer, can choose to have the VDECS installed in whatever location on its vehicle that it believes will be most safe and provide for most efficient operation, subject only to the requirement that placement conform with the VDECS manufacturers minimum qualifications (e.g., maximum distance from the exhaust manifold). The possible number of locations for installation and the number of configurations on the numerous types of vehicles regulated make it impractical for the ARB or the VDECS manufacturer to specify all the possible “safe” installations. On the other

hand, the fleet owner/operator is in the best position to ensure VDECS are safely installed.

Should the fleet owner believe that the VDECS cannot be safely installed and operated (e.g., impairment of operator visibility), section 2449(e)(8) of the regulation provides the fleet owner may request that the ARB Executive Officer find that the VDECS is not the highest level VDECS available for that type of vehicle. The regulation also includes an appeals process in which the fleet owner may request that an adverse Executive Officer determination may be reviewed by an impartial hearing officer.

Lastly, please see also a discussion of the authority of ARB to regulate GSE in the response to the POHLE comment Chapter III-A-19 of this FSOR.

2)b) ARB overestimated the availability of used vehicles

- 1. Comment:** There will be no market for used equipment - CARB staff has assumed that many contractors will be able to comply by purchasing used Tier 2 and Tier 3 equipment at industry auctions. It is highly unlikely that any contractor will dispose of a Tier 2 or Tier 3 compliant machine. In particular because the Tier 4 replacement machines will not be available until very late in the compliance schedule and Tier 2 and Tier 3 machines will have to make up the bulk of any compliant fleet. (CIAQC7)
- 2. Comment:** One of the components that really needs to be addressed is the availability of used vehicles in the marketplace. They have not done an analytical balancing in order to figure out if there's going to be enough Tier 2 and Tier 3 engines really available in the market for future purchase. (M3CON)
- 3. Comment:** New equipment was underestimated by your staff. They assumed there'd be a used equipment market. There isn't going to be. There isn't now. They're going to have to buy new. (CBCC3)
- 4. Comment:** They just had a huge auction up in Riverside. Almost no equipment was over Tier 2. Used equipment is not an option. It won't be because nobody's going to be giving up any of the good equipment. We have taken advantage of the repower money. (H-CAT)
- 5. Comment:** The Associated General Contractors (AGC) expects to demonstrate that engine and retrofit manufacturers, the used-equipment market, and suppliers and installers could not meet the demand that the rule would create for equipment essential to the construction industry. (PILCONIS) (AGCA3)
- 6. Comment:** How many new vehicles must be introduced into the fleet to achieve the proposed standards, versus the assumed reliance on used

vehicle purchases by the ARB staff. It is also important to note that many firms, particularly smaller businesses, rely on the used equipment market rather than purchasing new. Yet under the regulation the market for used equipment within would shrink substantially; only newer models will meet the air quality requirements and current owners would retain Tier 2 and 3 models to meet the various standards. (CIAQC1)

7. **Comment:** We believe CARB greatly overestimates what the market for Tier 2 and higher equipment will be during the life of this regulation. The reality is that most companies will buy new equipment or use CARB's exemption that allows companies to do nothing if a repower or used piece of equipment is not available. (TA)
8. **Comment:** ARB has overestimated the amount of Tier 2 and Tier 3 equipment on the used equipment AGC does not find it credible to suggest that the current owners of such equipment will readily dispose of it, as Tier 4 replacement engines/equipment will not be available until very late in the compliance schedule. Until then, Tier 2 and Tier 3 machines will have to make up the bulk of any compliant fleet. This mistake has compounded the effect of ARB's immediately preceding mistake, and further slanted its economic analysis. Few contractors will have the option of purchasing used Tier 2 and Tier 3 equipment at industry auctions. AGC strongly believes that engine and retrofit manufacturers, the used-equipment market, and suppliers and installers will not be able to meet the demand that the rule would create for equipment essential to the construction industry. As a threshold matter, equipment manufacturers have indicated that the demand created by ARB's regulation would exceed the availability of the required retrofit devices and replacement engines and machines. (AGCA3)
9. **Comment:** The Staff analysis assumes that most of the equipment required to meet the accelerated fleet turnover rate will come from the used equipment market. However, the analysis shows that the statewide fleet will have to add 3.4% more vehicles for 2010 to 2012, 3.0% for 2013 to 2020 and 2.0% from 2021 to 2030. For the initial period, this represents a 50% increase in the turnover rate in the Staff's emission inventory model, and a near doubling of the historic empirical turnover rate. The Staff has not demonstrated where the used Tier 3 and 4 equipment required to comply with the accelerated rule will come from—its analysis relies on the total used market that is dominated for Tier 0 and 1 equipment. Given that this rule will require significant new equipment purchases, based on EMA data, the new equipment market will have to expand by two thirds by 2010 to meet the increased demand. (CIAQC6) (AGCA3)

10. Comment: ARB staff's assumed reliance on used vehicle purchases is unrepresented and unsupported. How many new vehicles must be introduced into the fleet to achieve the proposed standards, versus the assumed reliance on used vehicle purchases by the ARB Staff. (CIAQC6) (AGCA3)

11. Comment: The used equipment market was overestimated. Virtually no compliant equipment will enter the used market in the future as fleet owners chase the emission reduction curve. (SCCA3)

12. Comment: Where will affordable and viable equipment come from? (DMCI)

Agency Response: We believe there will be sufficient numbers of used vehicles available to fleets to comply with the regulation. Although we acknowledge that firms subject to the regulation may tend to hold their Tier 2 and 3 vehicles, the used vehicle market is a national and indeed international market, so California fleets may purchase Tier 2 and 3 used vehicles from outside the State. Also, in the early years of regulatory implementation, large fleets may acquire used vehicles from small and medium fleets. Small fleets are not subject to the regulation's requirements until 2015 and even then are exempt from the NOx requirements; medium fleets are not subject to the regulation's requirements until 2013.

As described further in Attachment 3 to the Third Notice of Public Availability of Modified Text and Availability of Additional Documents, although there were some errors in the used equipment analysis in the Technical Support Document, staff redid the analysis and the new analysis supports the conclusions of the original analysis. The new analysis shows nearly the same total number of used vehicles and an even higher proportion of Tier 2 or higher vehicles than the Technical Support Document. The new analysis showed 72,594 used vehicles available for sale, 32,587 of which were likely to be Tier 2 or higher (model year 2003 or newer). The number of vehicles that were likely Tier 2 or better was actually 9 percent higher than the previous figures stated in the Technical Support Document.

We believe, as indicated by the 9 percent increase in 2003 or newer equipment over the past year that in the years to come even more Tier 2 and 3 used vehicles will become available for purchase by fleets to comply with the regulation. This will occur as Tier 0 and 1 vehicle naturally cycle out of service.

The turnover requirements imposed by the regulation will require a maximum of 10 percent (eight percent in the initial years) of a fleet's statewide horsepower to turn over each year. The baseline natural rate of turnover of the statewide fleet is about 5 percent per year. Thus, the regulation will at most require 5 percent more turnover per year than normal. The regulation affects about 180,000 off-

road vehicles. Therefore, the maximum annual (incremental) increase in demand for Tier 2 or better vehicles and engines in California will be an additional 5 percent, or about 9,000 per year. This demand will be satisfied through a combination of engine repowers, purchase of new vehicles, purchase of used vehicles, and installation of NOx retrofits. Even if all the turnover demand were satisfied through used vehicle purchases, though, as noted above, there are over 32,000 used Tier 2 or higher vehicles available for sale at any time, which will be more than sufficient to satisfy the demand.

Finally, if a fleet does face unavailability of a specific used vehicle it needs, the regulation contains provisions to protect that fleet from being penalized. The regulation's specialty vehicle provisions in section 2449.1(a)(2)(A)4. Provided that if there is no used vehicle available to replace a vehicle and a repower is not available, the vehicle is exempted from the turnover requirements.

3. Chapter 3

3)a) Regulation is not concisely worded

13. Comment: The regulation does not comply with the Administrative Procedure Act's standard for clarity because it uses more words than necessary. For example, the text in section 2449.2(a)(2)(A)4. Exemptions, as written as follows do not comply with the Administrative Procedure Act's standard for clarity:

4. Exemptions – The following exemptions from the retrofit requirement apply, provided that retrofits have been or are being applied to all other engines in the owner's fleet not subject to these exemptions. A fleet is exempt from the retrofit requirement in 2449.2(a)(2)(A)1 if all its vehicles' engines meet one of the criteria below:

- Engines in vehicles less than 5 years old,
- Engines for which there is no highest level VDECS (i.e., for which there is no Level 2 or 3 VDECS, or for which there is a Level 2 or 3 VDECS which cannot be used with impairing the safe operation of the vehicle as demonstrated per section 2449(c)(8)),
- Engines equipped with an original equipment manufacturer diesel particulate filter that came new with the vehicle, or
- Engines already retrofit with a level 2 or 3 VDECS that was the highest level VDECS available at time of installation.
- An engine with a Level 2 VDECS that was not the highest level VDECS at time of installation does not qualify for this exemption.

The text from Section 2449.2(a)(2)(A)4. Exemptions should be corrected for clarity as followed:

4. Exemptions – The following engines are exempt from the retrofit requirement.
 - a. Vehicle engines where the vehicle is less than five years old,
 - b. Engines where a Highest Level VDECS is unavailable, or where a Highest Level VDECS would result in unsafe operation of the vehicle per section 2449(e)(8),
 - c. Engines equipped with an original equipment manufacturer diesel particulate filter when new, or
 - d. Engines with a Highest Level VDECS that was the highest-level VDECS available at the time of installation.

The corrected text has the same exact result as the original adopted text at 79 words compared to the original text at 175 words. More than 50% of the original text is superfluous and obfuscates intent. Also, the following text in section 2449.1(a)(2)(A)4 should be revised for clarity:

Exemptions – Vehicles meeting the criteria below are exempt from the turnover requirement. A fleet is exempt from the turnover requirement in 2449.1(a)(2)(A)1, if all its vehicles meet one of the criteria below:

- Vehicles less than 10 years old – if all vehicles in a fleet will be less than 10 years old on the compliance date, not turnover is required.
- Specialty vehicles if all the following criteria are met:
- The fleet has turned over all other vehicles first,
- No repower is available for the specialty vehicle, as demonstrated to the Executive Officer,
- A used vehicle with a cleaner engine is not available to serve a function and perform the work equivalent to that of the specialty vehicle, as demonstrated to the Executive Officer, and
- The specialty vehicle has been retrofit with highest level VDECS.
- A vehicle retrofit within the last six years with a Level 2 or 3 VDECS that was highest level VDECS at the time of retrofit.
- A vehicle with a Tier 4 interim engine or Tier 4 final engine.

The following is corrected for clarity:

4. Exemptions – The following engines are exempt from the fleet turnover requirement.
 - Vehicle engines where the vehicle is less than ten years old,
 - Engines in specialty vehicles if all the following criteria are met;
 - No repower is available for the specialty vehicle engine, as demonstrated to the Executive Officer,
 - A used vehicle with a cleaner engine is unavailable as demonstrated to the Executive Officer, and

- A vehicle engine retrofit equipped with the Highest Level VDECS at the time of retrofit.
- Tier 4 interim engine or Tier 4 final engine.

The original text is 179 words long. The revised text is 94 words long. Almost 50% of the original text is again unnecessary. Also consider the introductory paragraph from section 2449.2(a)(2)(A)4 as followed:

“The following exemptions from the retrofit requirement apply, provided that retrofits have been or are being applied to all other engines in the owner’s fleet not subject to these exemptions. A fleet is exempt from the retrofit requirements of 2449.2(a)(2)(a)1. if all its vehicles’ engines meet one of the criteria below:”

The following text from section 2449.2(a)(2)(A)1. is revised below for clarity:

“The following engines are exempt from the retrofit requirement.”

The original first sentence is not only awkwardly phrased; it says that exemptions do not apply to nonexempt engines. This is nonsensical and succeeds in making a simple point complex and confusing. This same reasoning appears again in the section on exemptions from fleet turnover requirement for specialty vehicles. The text in section 2449.1(a)(2)(A)4.i:

“The fleet has turned over all other vehicles first “.

In a clear well written rule, all text must have a clear and concise purpose that is essential to a rule. The text again suggests an operator would somehow conclude that because one vehicle is exempt then all nonexempt vehicles would be exempt as well. This raise the bizarre prospect that if this specific text was eliminated that nonexempt equipment would become exempt. The elimination of this text would in fact not only no affect on what is exempt and what is not, but would clarify that very point. The second sentence in that introductory paragraph to the retrofit exemptions:

“A fleet is exempt from the retrofit requirement in 2449.2(a)(2)(A)1 if all its vehicles’ engines meet one of the criteria below:”

The text here says if all of your engines are exempt then all your engines are exempt, and is equally pointless. The same reasoning appears again in section 2449.1(a)(2)(A)4 and in section 2449.1(a)(2)(A)4.a:

“A fleet is exempt from the turnover requirement in 2449.1(a)(2)(A)1 if all its vehicles meet one of the criteria below.” (If all your engines are exempt, then all your engines are exempt.)

“If all vehicles in a fleet will be less than 10 years old on the compliance date, no turnover is required.” (If all your engines are exempt then all your engines are exempt.)

By stating the obvious, the rule text again succeeds in making a simple point confusing. It again raises the bizarre prospect that the elimination of such text might somehow affect when an operator is exempt and when he is not. On the contrary, the elimination of such text not only has such affect, it again clarifies that very intent. (CIAQC9)

Agency Response: We disagree. The commenter provided rewording of several subsections of the regulation, section 2449.1(a)(2)(A)4. and 2449.2(a)(2)(A)4, in a shorter form and claims that the shorter version has the same meaning as the original language. We agree that the version provided by the commenter is shorter in length, yet it has a fundamentally different meaning from the original regulatory language.

For example, if the text of section 2449.1(a)(2)(A)4. were reworded as suggested, a fleet required to turn over 8 percent of its horsepower in one year could show that 8 percent of its horsepower met one of the criteria in section 2449.1(a)(2)(A)4.a. through d. and conclude that it was exempt from the turnover requirements in that year. Instead, the original regulatory language indicated that the fleet must show that “all its vehicles meet one of the criteria” in order for the fleet to be exempt from the turnover requirements. The exemption provision was specifically crafted to prevent fleets from avoiding the turnover requirements if only a portion of the fleet’s vehicles were exempted from compliance. Similarly, if section 2449.2(a)(2)(A)4. were reworded as suggested, a fleet required to install retrofits on 20 percent of its horsepower could avoid having to install any retrofits in a year by showing that 20 percent of its horsepower met one of the criteria for exemption in section 2449.2(a)(2)(A)4.a. through d. Instead, the original regulatory language in section 2449.2(a)(2)(A)4. required the fleet to show that all the vehicles in the fleet that have not been retrofitted to date meet one of the criteria for exemption in order for the fleet to be excused from having to take any further action on retrofits.

To address any confusion that stakeholders might have, ARB modified the language of sections 2449.1(a)(2)(A) 4 and 2449.2(a)(2)(A)4 in the third Notice of Public Availability of Modified Text and Availability of Additional Documents, released on March 5, 2008 to make it more clear. However, the intent of the revised language remains the same:

- All of a vehicles in the fleet that have not been turned over to date must meet one of the turnover exemption criteria in order for the fleet to be exempt from further turnover of vehicles; and
- All of a fleet's vehicles must have been retrofitted or meet one of the retrofit exemption criteria in order for a fleet to be exempt from any retrofitting of vehicles.

4. Chapter 4

4)a) Greenhouse gas impacts

1. **Comment:** ARB underestimated the greenhouse gas emission increases that will occur due to the regulation. I estimate the overall greenhouse emission impact of the ORD regulation to be an increase of 394,040 metric tones per year of CO₂ emissions in the year 2020. A significant portion of the impact derives from the manufacturer of the machine parts, transporting the machines, and manufacturing the urea for the SCR systems. These emissions occur whether or not the machine is even being operated. My results are summarized in Figures 1 and 2 below.
(JOSEPH)

(Note: The entire comment is included as Appendix A to the FSOR)

Figure 1- Estimated 2020 CO₂ Emissions Associated with Life Cycle Steps of ARB ORD (excludes idling benefit)

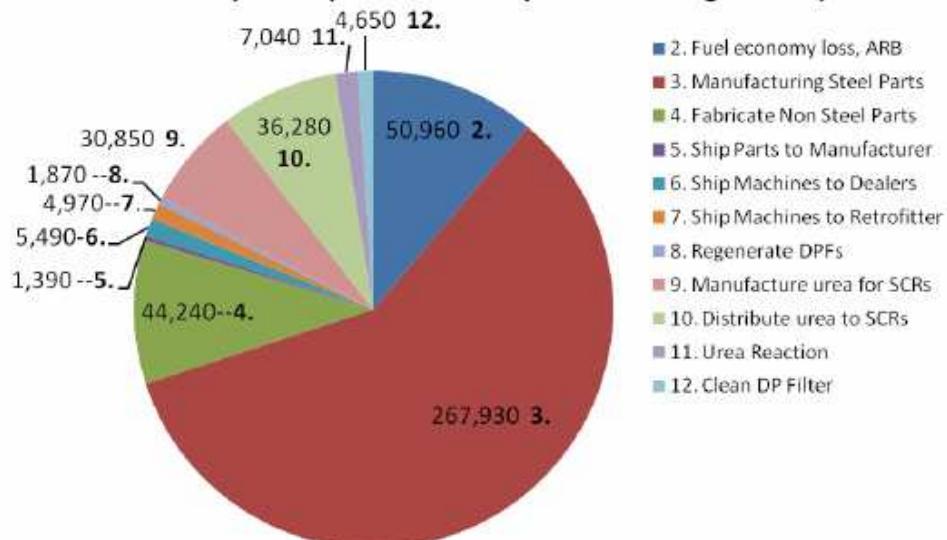
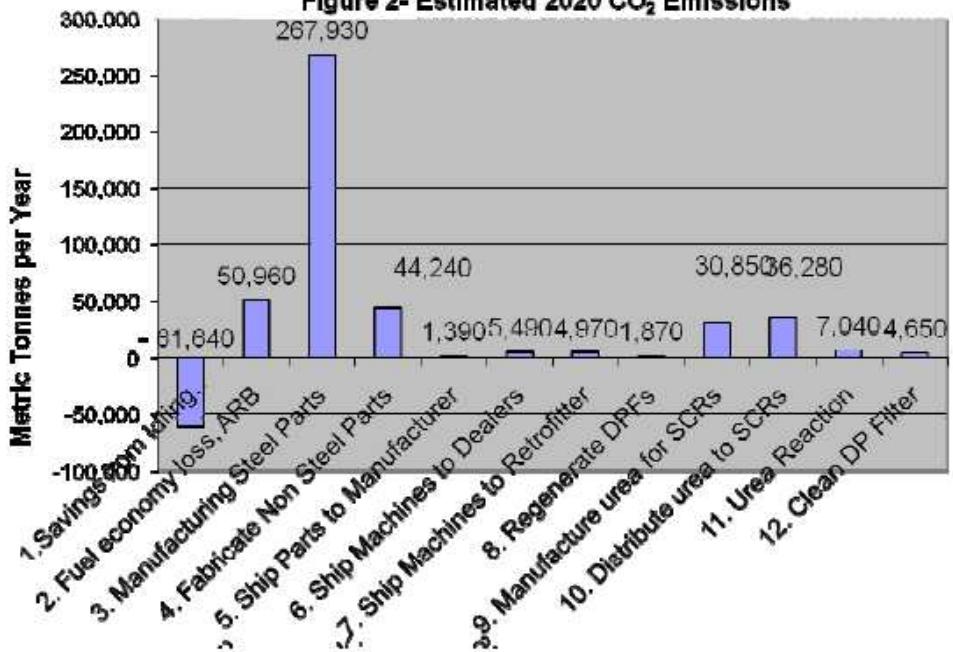


Figure 2- Estimated 2020 CO₂ Emissions



Agency Response: The commenter's analysis is founded upon incorrect assumptions and therefore comes to incorrect conclusions. The largest mistakes in the commenter's analysis are (1) a large overestimate of the amount of new vehicles that must be purchased to comply with the regulation, and (2) a large overestimate of the use of selective catalytic reduction devices. These two mistakes lead to a huge inflation in greenhouse gas emissions, and – when corrected- the commenter's analysis becomes consistent with ARB staff's. Therefore, ARB staff stands behind the original conclusion of its greenhouse gas analysis, as described in Section VI.C of the Staff Report, i.e., we expect the regulation to have a negligible effect on global warming.

The commenter incorrectly assumed:

An incremental increase of new vehicles purchased due to the regulation of approximately 37.5 percent of the statewide fleet, and

All aftertreatment systems are designed for both PM and NOx reduction, meaning they have both diesel particulate filters and selective catalytic reduction devices.

The first assumption is based upon the work of M Cubed. The M Cubed "chain of transactions that net to the purchase of a new piece equipment" methodology incorrectly assumes that California is a closed model; i.e., vehicles in California will never leave or enter the national or world market. This assumption directly contradicts testimony from Ritchie Brothers, one of the largest auction houses selling off-road vehicles, at the July 26, 2007, Board meeting, in which Ritchie Brothers stated that off-road vehicles are traded nationwide and worldwide. M Cubed cites the "need to do the analysis not from the perspective of a single firm, as the Staff has done, but rather by tracing transactions involving a single vehicle. Only this way can it be determined when a vehicle actually leaves the fleet." However, California represents only 11 percent of the national equipment market, and to assume that no vehicles enter or exit the state, is incorrect.

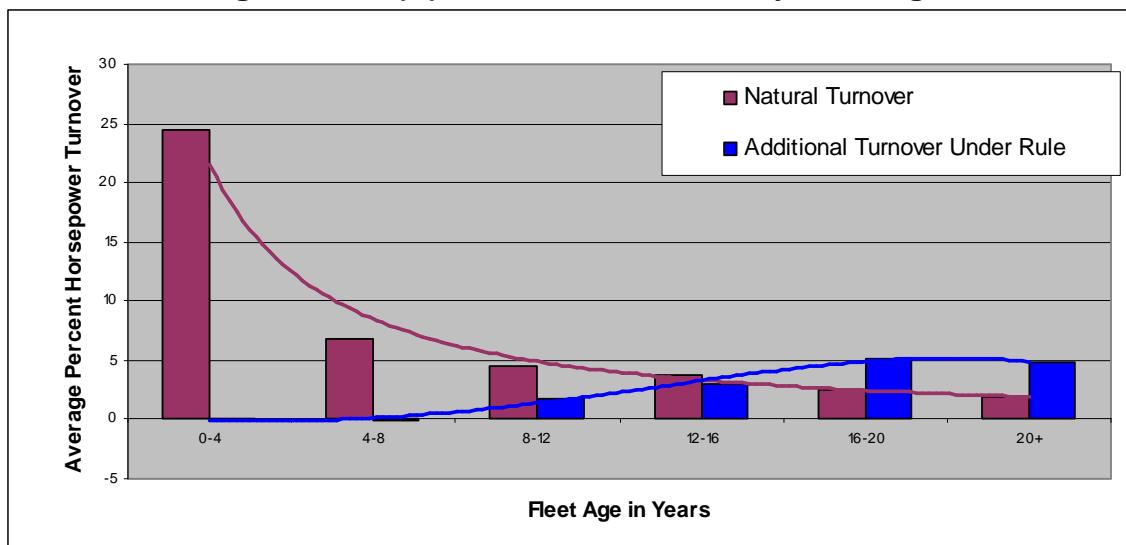
The flawed "chain of transactions" method implicitly assumes that the increased turnover activity due to the regulation among the various aged fleets is equal; i.e., older fleets would not experience an incremental turnover any greater than a new fleet and that, "This net turnover rate represents new equipment additions to the statewide fleet..." This is incorrect.

The regulation would impose upon different fleets different increments of increased turnover depending upon the average age of the fleet. Utilizing data from 200 fleets actually operating in California, staff modeled the turnover these fleets would incur to comply with the regulation from 2010 through 2020. Based upon this model, staff have estimated the natural turnover rate for the 200 fleets in the absence of the regulation and also estimated the average turnover rate for the 200 fleets when complying with the regulation.

As shown in Figure III-B-4)a)-1, newer fleets of zero to eight years that already have a high rate of vehicle turnover will not need do any additional turnover under the regulation. On the other hand, to comply with the regulation, older fleets 16 years and older will need to do significantly more turnover than they normally do.

As modeled by staff, under the regulation, the majority of new vehicles entering the statewide fleet would be purchased in the course of normal business by the very youngest, cleaner fleets. Staff modeling showed that fleets from zero to eight years of age would not incur any incremental increase in turnover or retrofit due to the regulation; all of the new vehicles purchased by these fleets would be purchased in the normal course of business (therefore the cost of these new vehicles is not attributable to the regulation).

Figure III-B-4)a)-1 Percent Turnover By Fleet Age



As discussed in the Appendix H of the Technical Staff Report, staff modeled fleets of zero to eight years of age purchasing new vehicles, fleets of eight to twelve years of age purchasing one-year-old used vehicles; 12 to 16 year old fleets purchasing used 2-year-old vehicles, 16 to 20 year old fleets purchasing used 3-year-old vehicles, and 20 year old and greater fleets purchasing used 4-year-old vehicles.

As logic would dictate, under the regulation, the older, dirtier fleets will have a greater incremental increase in turnover and retrofit than the newer, cleaner fleets. Thus, in the staff models the incremental increase of one-year-old vehicles is greater than the incremental increase of new vehicles, and the incremental increase of two-year-old vehicles is greater than the incremental increase of one-year-old vehicles, and so on.

The M Cubed “chain of transactions” is unable to capture the differing incremental increase in turnover and retrofit of various age fleets

Table III-B-4)a)-2, provides the same data (rounded) as Figure III-B-4)a)-1 in tabular form. It also includes the percent average regulation turnover through 2020, percent of total statewide horsepower that the fleet average age bin represents and the replacement vehicle age.

As modeled, staff estimated that there would be little or no additional demand for new vehicles resulting from the regulation, but there would be a significant increase in demand for relatively new, used vehicles. Staff recognizes that older fleets may choose to buy new vehicles rather than their more typical practice of purchasing used vehicles and this would represent an increase demand for new vehicles; but, newer fleets may choose to purchase used vehicles. On average, staff believes that older fleets faced with the requirement to turn over additional vehicles would choose the least-cost option of buying slightly newer, cleaner, used vehicles.

Table III-B-4)a)-2

	Percent Natural Turnover	Percent Average Regulation Turnover Through 2020	Additional Turnover Under Regulation	Percent of Total Statewide Horsepower	Replacement Vehicle Age Modeled
0-4	24	24	0	1	0
4-8	7	7	0	16	0
8-12	5	6	2	34	1
12-16	4	7	3	28	2
16-20	3	8	5	17	3
20+	2	7	5	4	4

Thus, the net result of the regulation would be to cause little or no increase in demand for new vehicles but instead would be to cause an increase demand for out-of-state used vehicles as this will likely be the least-costly option for fleet owners to comply with the regulation.

Thus the commenter's emissions calculated in steps 3 (manufacturing steel parts), 4 (fabricating non-steel parts), 5 (shipping parts to manufacturer), and 6 (shipping machines to dealers) are incorrect and should be, within a certain range of uncertainty, zero.

The commenter's second and third assumptions are very unlikely and inconsistent with staff estimates. The commenter assumes, “Approximately 100 percent of the off-road fleet operating in 2020 will have aftertreatment devices.... All aftertreatment systems are designed for both PM and NOx reduction meaning

they have both diesel particulate filters and selective catalytic reduction (SCR) devices."

Currently, the ARB verification process for aftertreatment devices is primarily based solely upon verifiable reductions in PM; NOx may or may not be reduced, and in most cases, is not.

Staff modeled various percent of vehicles with SCR up to a maximum of five percent as discussed in Chapter XI of the Technical Support Document; but in the final analysis concluded that it was unnecessary to model any SCR to meet the NOx fleet average targets (not including any that engine manufacturers may include in Tier 4 engines).

In 2020, staff estimated that after complying with the regulation there would still be 41 percent non-Tier 4 engines in the statewide fleet. As modeled, all of these non-Tier 4 engines would eventually be retrofitted, but none would have SCR. From a fleet owner perspective, fleet owners will likely avoid the expense and inconvenience of SCR if they can comply with the regulation without it.

Of the 18 Level 3 VDECS currently verified by the ARB (this includes on-road, off-road, and stationary applications) only three are verified as reducing NOx. There is the Longview which integrates a NOx reduction catalyst and catalyzed wall-flow silicon carbide diesel particulate filter. This provides simultaneous reduction of NOx, PM, hydrocarbon (HC) and carbon monoxide (CO) from one system. And there are the EGR Technologies LLC/CleanAIR Systems and the Johnson Matthey EGRT both of which use exhaust gas recirculation technology to reduce NOx. None of the currently verified Level 3 VDECS that reduce NOx use SCR.

At this time, it is unclear what strategy engine manufacturers will use to meet Tier 4 NOx standards. Some may use SCR, and some may not. Regardless, since, as described above, the regulation is not expected to significantly increase the demand for new vehicles, any SCR systems in new Tier 4 vehicles would have been there even in the absence of the regulation. Overall, it appears that the commenter has greatly overestimated the greenhouse gas emissions in steps 9 (manufacture urea for SCR), 10 (distribute urea for SCR), and 11 (urea reaction). Thus the commenter's emissions calculated in steps 9, 10, and 11 are uncertain at best and likely far less than estimated.

Staff has not analyzed the remaining steps provided by the commenter other than to note that the GHG emissions from the remaining steps are approximately zero.

Regardless, as discussed in the Chapter VI of the Staff Report and Chapter IX of the TSD, the regulation will reduce black carbon emissions, which contribute to global warming. It is difficult at this time to estimate the impacts of reductions of

these pollutants on climate change. The U.S. EPA did not estimate climate-associated benefits for the new Tier 4 standards for nonroad diesel engines since there is no global warming potential yet assigned to black carbon as there are for gases such as carbon dioxide, methane, and nitrous oxide. The U.S. EPA also stated that it would be important to characterize all of the effects of the regulation on climate, including tropospheric ozone and fuel economy, but the methods to conduct such an assessment are not available.

In conclusion, we believe the JOSEPH comment's greenhouse gas analysis is deeply flawed and greatly overstates the greenhouse gas increases due to the regulation. We believe the original conclusion of our greenhouse gas analysis - a negligible effect on global warming from the regulation - as described in Section VI.C of the Staff Report and documented further in the Section IX.D. of the TSD, is valid.

5. Chapter 5

5)a) Weekend effect

1. **Comment:** Although virtually ignored by ARB, credible data suggest that reducing NOx does not appreciably reduce ambient ozone concentrations and may even increase ambient ozone concentrations. As reported in the August 29, 2007, edition of Inside EPA, Dr. Douglas Lawson of the U.S. Department of Energy's National Renewable Energy Laboratory summarized the findings of his recent research as follows:

I am not opposed to reducing NOx but I am opposed to doing stupid things. We've spent billions to reduce ozone, and it is either not reducing or increasing in many parts of the country....Emission control regimes on the books... place more emphasis on NOx cuts than on hydrocarbons and that means ozone may get worse. It has increased in Denver and Dallas and has been flat [in Los Angeles].

According to recent research by Dr. Lawson and earlier research from 2003, lower weekend traffic and congestion make weekend NOx levels lower than weekday NOx levels. Today's weekend levels are comparable to the weekday levels that we will achieve after implementation of currently planned and adopted future NOx controls, such as the ORD rule. Perhaps counter intuitively, lower weekend NOx levels do not lead to decreased weekend ozone levels, but instead to ozone levels that are actually higher than during the week. These and related papers by eminent scholars support the contention that NOx reductions will result in higher ozone levels in California's urban areas. Quite simply, it is counterproductive for ARB to consider this unprecedented rule without certainty that it will benefit air quality in California. Even if the ORD rule does not increase ozone concentrations in California, ARB's

environmental documents must consider the weekend-weekday phenomenon's lesser suggestion that NOx controls will not reduce ozone levels as much as predicted in the absence of that phenomenon.
(JOSEPH)

Agency Response: We disagree that the weekend effect findings mentioned by the commenter indicate that the regulation should be changed in any way.

First, the regulation contains provisions aimed at reducing diesel PM and NOx. The weekend effect is irrelevant to the diesel PM provisions because it concerns only NOx. As described further below, the latest modeling conducted by scientists at ARB indicates that very large reductions in NOx are needed to reach attainment of the health-based federal ambient air quality standards for ozone and final particulate matter (PM2.5). This supports the need to maintain the provisions in the regulation aimed at reducing NOx emissions.

Although we recognize the weekend effect (ambient ozone increases due to NOx quenching) can occur locally in some situations, to have any hope of attaining the ozone standard in the South Coast and San Joaquin Valley, large reductions of NOx are needed. There would be no way to reach attainment without reductions in NOx of 80 to 90 percent. Currently, the South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Air Pollution Control District (SJVAPCD) have submitted to U.S. EPA SIPs which demonstrate attainment of the federal 8-hour ozone standard by 2024. To attain the federal ozone standard, NOx reductions of nearly 90 percent (from 2006 levels) are needed in the SCAQMD, while NOx reductions of about 80 percent are needed in the SJVAPCD.

For the most recent round of State Implementation Plans developed by ARB for the South Coast and San Joaquin Valley, using the most recent emission inventory available, ARB staff modelers ran various combinations of NOx and volatile organic compound (VOC) emissions reductions. The combinations generated a data set of predicted ozone levels as a function of percentage reductions of anthropogenic NOx and VOC emissions. The data was plotted as carrying capacity diagrams, which shows the level of emissions that the atmosphere can "carry" and still demonstrate attainment. Planners looked at the combinations of VOC and NOx percentage reductions that are needed to attain the standard and then developed a corresponding control strategy.

Carrying capacity diagrams also indicate qualitatively whether a strategy of reducing only VOC emissions, a NOx-only strategy, or a combination strategy is needed to achieve the national ambient air quality standards. When the lines on the diagrams are more horizontal, this indicates that more NOx control is needed. When they are more vertical, a control strategy requires more VOC control. Some carrying capacity diagrams for areas with large emission reduction needs for attainment (such as Arvin in the San Joaquin Valley) show lines that are

curved in the upper right hand portion of the plots. This indicates VOC control would be advantageous in the beginning years of the control program. Further down on the same plot, the lines are flat, indicating that VOC reductions do not reduce ozone further, while NOx reductions do. For such areas, a combination strategy in the early years of control will reduce ozone fastest. Thereafter, the areas must rely fully on NOx controls for attainment.

In our modeling, for both ozone and PM2.5, we took into consideration the interactions between precursor emissions in ozone and fine particulate formation not just on weekdays, but also on weekends. For ozone, we modeled several episodes, and these included both weekdays and weekends. For PM2.5, we modeled an entire year. So the need for NOx and VOC reductions, at the levels determined by modeling, took into account the weekend effect.

Finally, even if the NOx reductions were not beneficial in reducing ambient ozone concentrations (which, as described above, we do not concede), because NOx reacts in the atmosphere to form nitrate particles, they are needed to reduce ambient PM2.5 concentrations.

6. Chapter 6

6)a) SOON should be fully funded

1. **Comment:** SOON should be fully funded. The original thoughts behind the SOON program was that it was to be a fully funded program. Now it is turning into a partially funded "Carl Moyer Program" and the contractor pays the balance. The contractor can not continue to bear the cost of added regulations. (ACI2)

Agency Response: The commenter is correct to note that when a fleet receives SOON funding for a repower, it will likely be responsible for a small part of the repower cost because most, if not all, of the SOON program funding will be supplied through the Carl Moyer Memorial Air Quality Standards Attainment (Carl Moyer) Program. Under the 2005 Carl Moyer guidelines, only the incremental cost (i.e., the cost beyond that expected during the normal course or business) of cleaner-than-needed equipment can be paid with Carl Moyer funds to achieve early or extra emissions reductions. Historically, such costs typically include such things as the costs to rebuild an engine back to its original configuration.

However, staff agrees that SOON funding supplied through the Carl Moyer program should be fully funded in cases where a fleet can demonstrate they have already incurred these costs. For instance, if a fleet can demonstrate that they have recently rebuilt an engine being repowered through SOON, and thus would not likely have incurred this cost during the normal course of business, then the entire repower cost may be eligible for funding. For engines that have

not been rebuilt recently, SOON funding will cover the portion of the repower cost that is greater than the cost of rebuilding the engine.

Based on records of disbursements for Carl Moyer projects over the past 6 years for Tier 3 repowers, staff estimates that SOON funding is projected to cover 85 percent of the cost of an engine repower. As such, this represents an additional near-term cost to fleets participating in the SOON program. However, after the SOON project contract period ends, the participating fleet will be able to credit the actions funded by SOON toward fleet compliance with the statewide off-road regulation. As such, a participating fleet should realize a significant long-term savings by participating in the SOON program. Fleets that apply, but do not receive, requested SOON program funding are not required to take action beyond compliance with the statewide off-road regulation.

It is important to note that local air districts participating in the SOON program are not required to use Carl Moyer incentive monies to fund the SOON program. If other funding is available to a local air district (including funds that may have no incremental cost requirements), those monies could potentially be used to fully fund SOON projects.

6)b) SOON should be removed from the ARB Regulation

- 1. Comment:** The SOON Program should be removed from the ARB Regulation. The cost of the ARB regulation is enough of a burden. Contractors should not have the added burden of dealing with the State Regulation and also the Local Air District Regulation. It is going to be difficult enough for contractors to deal with the calculations and regulations of the ARB regulation. We do not need an additional agency controlling the same type of emissions. (ACI2)

Agency Response: We disagree. The SOON program is targeted to areas of the state that have more serious air pollution problems and need additional emissions reductions to meet federally mandated air quality standards. Local air districts, along with ARB, have a shared responsibility to coordinate planning and achieve necessary emission reductions to meet these federally mandated air quality standards.

As structured, the SOON program is limited to certain air districts that opt into the program, and the program can only be mandatory for fleets with a total horsepower of 20,000 or more, and that have greater than 40 percent Tier 0 and Tier 1 engines in their fleet. As discussed in second Notice of Public Availability of Modified Text and Availability of Additional Documents, there will be up-front costs incurred by the fleets participating in the program in the year they receive SOON funding. As discussed in the responses in Chapter III-A-9 of this FSOR, these costs include administrative costs, as well as the fleet's portion of costs for engine repowers or vehicle replacements. However, once each SOON project

contract period ends, the participating fleet will realize an economic benefit in that it will essentially get back more than it contributed to participate in SOON because it will be able to credit actions funded by SOON (using public monies) toward fleet compliance with the regulation.

The ARB will coordinate with local air districts that opt into the SOON program in an effort to limit the administrative burden placed on participating fleets, and to provide consistency among local air districts. The ARB also plans on providing participating fleets with tools that will enable them to efficiently plan compliance. ARB staff will hold outreach workshops, training sessions, and meetings with individual fleets on regulation topics, including the SOON program and how it may benefit fleet owners.

7. Chapter 7

7)a) Want another public hearing

1. **Comment:** The Board needs to convene a public hearing on the proposed rule changes and on the SOON program. This is per California Government Code 11346.8(a) that states a hearing is required. (CIAQC4)

Agency Response: We disagree. At the July 2007 Board hearing, ARB staff presented to the Board for its consideration proposed changes to the off-road regulation. Among the proposed changes was the SOON program. The Board reviewed, considered, and took public testimony on the proposed changes. Before voting to approve the regulation, as modified at the hearing, the Board engaged in detailed discussion about the SOON program and other proposed changes. In Resolution 07-19, the Board specifically directed staff to incorporate the changes, including the SOON program, into the off-road regulation and to make the changes available for public comment for at least 15 days.

Having been delegated by the Board to make the modifications publicly available, the Executive Officer made the changes available to the public in three publicly noticed mail-outs. The First Notice of Public Availability of Modified Text and Availability of Additional Documents was made available for public comment from December 11, 2007 through January 8, 2008. This first notice included many of the modifications approved by the Board, but did not include those modifications that pertained to the SOON program. Consistent with the Board's directions, ARB issued a Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008, which included modifications pertaining to the SOON program. The second notice was available for public comment through March 6, 2008. A Third Notice of Public Availability of Modified Text and Availability of Additional Documents was issued on March 5, 2008, and made available for public comment through March 20, 2008. Pursuant to the Board's direction, after review and consideration of all comments received, the Executive Officer formally adopted the regulation.

In doing the above, ARB has fully complied with the requirements of Government Code 11346.8, and no additional formal Board hearing is necessary. ARB has previously addressed this question from the commenter in a January 18, 2008, letter to Michael Lewis, Senior Vice President, Construction Industry Air Quality Coalition. Therein, ARB stated that further public hearings before the Board to address proposed rule changes would not provide significant new information for the Board to consider. ARB staff held 13 public workshops and 8 public workgroup meetings during development of the regulation, and the Board conducted two days of public hearings to consider adoption of the regulation (May 25, 2007, and July 26, 2007), during which time the public had more than 110 days in which to provide comments to the Board. One hundred and forty people testified on the regulation, including the impact of the regulation on the construction industry. Also, as addressed in the January 18, 2008, letter and stated above, the Board and affected stakeholders fully discussed and considered the SOON program at the July 26, 2007, Board meeting, and the Board specifically approved the program for adoption in Resolution 07-19.

7)b) ARB should do a big outreach effort after the adoption of the regulation

1. **Comment:** The Board should direct staff to develop a complete outreach program and make sure that all the stakeholders are informed on the regulation. (NWS2)

Agency Response: We agree that there is a need to develop and implement a thorough outreach program. During the rulemaking process, staff began the process to outreach to affected stakeholders about the regulation. We will continue and expand upon these efforts during implementation of the regulation.

For a discussion of the outreach conducted during development of the regulation, please see the response in section III-A-16)h) of this FSOR. For a further discussion of staff's planned outreach activities, please see the response in section III-A-16)p) of this FSOR.

8. Chapter 8

8)a) California Administrative Procedure Act (APA)

1. **Comment:** In Resolution 07-19, the Board appears to have delegated the final revisions and Final Statement of Reasons to ARB's Executive Officer, with directions to return to the Board only if circumstances (such as the public comments) appeared "warranted" to the Executive Officer. The APA does not provide administrative agencies the authority to delegate statutory approval authority to staff. See, e.g., Gov't Code §11343(f), 11343.5, 11344.2 (APA expressly allows delegation of lesser functions). With exceptions not here relevant, however, ARB's enabling legislation

authorizes the Board to “delegate any duty to the executive officer that the state board deems appropriate.” Health & Safety Code §39515(a).

Nonetheless, as the caveat at the end of the above-quoted Resolution indicates, the Board did not intend the Executive Director and ARB staff to amend the off-road rule wholesale. The Board is the proper decision maker for deciding important policy issues. (JOSEPH)

Agency Response: The commenter is in error when it characterizes as irrelevant the authority granted by H&SC § 39515, which allows the Executive Officer to exercise and perform such powers, duties, purposes, functions, and jurisdiction vested in the Board and delegated by it to the Executive Officer. Upon delegation, the Executive Officer clearly has the authority under the APA to make the modification directed by the Board and to make such further modifications deemed necessary to address comments submitted by stakeholders. The Board further delegated to the Executive Officer the discretion to return to the Board for further consideration if he determined that it was necessary. (Resolution 07-19). This, too, was in the Board’s purview and does not conflict with the APA. The commenter fails to cite any provision of the APA that would support its assertion that the APA prohibits an agency from delegating its authority to take final action on a regulation after the agency has approved the regulation. The commenter’s reference to APA sections that expressly provide for delegation of lesser functions does not in anyway allow for one to rationally infer that the Board cannot delegate its authority to adopt regulations to its Executive Officer and clearly does not override the express authority granted under the Health and Safety Code that permits such a delegation to occur.

2. **Comment:** The Surplus Off-road Opt-in for NOx (SOON) program under consideration by ARB staff differs greatly from the SOON program discussed by the Board at the public hearing in July on issues as fundamental as the voluntary versus mandatory nature of the program and its full funding versus partial funding. To ensure that staff implements the Board’s vision and to allow the public an opportunity to comment on the SOON program at a public hearing, the Board must put this proposed regulation back on its public-hearing docket. As it now stands in draft form, the SOON program in no way qualifies as so “sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action.” See Gov’t Code §11346.8(c)(2). Without that relationship to ARB’s originally proposed off-road rule, the SOON program is ineligible for adoption via the 15-day process envisioned in ARB’s notice of this 15-day comment period. (JOSEPH)

Agency Response: ARB respectfully disagrees with the commenter’s contention that the SOON program, as adopted fundamentally differs from the program initially presented to and approved by the Board at its July 26, 2007, hearing. Specifically, the commenter suggests that the SOON program

presented to the Board was voluntary and that stakeholders who participated would receive full funding. On both counts, he is wrong. In Resolution 07-19, the Board approved the SOON program, stating:

Add a new section using incentive-based funding, consistent with the approach taken in Attachment C hereto – made available by staff at the hearing – that would allow any air quality management district and air pollution control district to achieve additional NOx reductions from in-use off-road heavy-duty diesel vehicles operating within its air basin by opting to follow the requirements of the section and providing incentive funding to fleets that would be required to apply for funds and, if received, use the funds to achieve real, calculable, and enforceable surplus NOx emission reductions [emphasis added]. . . .

Attachment C to the Resolution, which was distributed to the Board and audience at the July 26, 2007, board meeting, was unmistakably clear that the SOON program was mandatory to the extent that it applied to the largest fleets having 20,000 or more total maximum horsepower and consisting of 40 percent or more Tier 0 and Tier 1 vehicles. Under the proposal, if those fleets had vehicles that operated within an air district that opted into the SOON program, the fleets would be required to calculate their NOx target rate for those vehicles that operated in the district and, if the target rate exceeded the NOx index number, be required to apply for SOON funding. If funding was made available, the fleet would be required to take necessary actions to achieve the required NOx emission reductions. As set forth in Attachment C, such funding would be subject to the requirements and guidelines of the particular funding program, including the Carl Moyer Program. Contrary to the commenter's claims that the initial proposal guaranteed full funding, the Carl Moyer Program, for example, does not guarantee 100 percent funding. When the program was adopted, it was understood that some co-funding by participating fleets would be required. In fact, Mike Lewis, Senior Vice President of the Construction Industry Air Quality Coalition, testified at the July 26, 2007, Board meeting that SOON would require co-funding from participating fleets. Mr. Lewis said, "And participation in the SOON program isn't free. They're going to have to match the cost of those engines and they're going to have to pay a hundred percent of the cost of those particulate traps. So, this isn't something that is free to the contractors. It's going to cost them more to do it." For the foregoing reasons, it is clear that the above-described provisions of the SOON program, as ultimately adopted, did not substantively modify those provisions of Attachment C that were presented to and considered by the Board.

Contrary to the commenter's claims, the SOON program as adopted is substantially (not just sufficiently) related to the SOON proposal that was before the Board on July 26, 2007. At that hearing, the proposal was fully commented upon by stakeholders and considered by the Board. (For example, see Transcript from July 26, 2007 Board hearing, at 49-52, 74-75, 135, 172, 221-224, and 247.) To the extent that the commenter is suggesting that the SOON

program is not sufficiently related to the initially proposed regulation, ARB would like to point out that the regulation, as initially noticed and proposed, set forth in-use fleet performance requirements, including NOx and PM fleet average requirements. The Notice also made clear that the Board might consider amendments to strengthen those requirements and to provide greater flexibility to stakeholders. It is to that end that the SOON program was considered and adopted. The SOON program is a NOx fleet average requirement, and, as testified to by Mr. Lewis, the SOON program was a potential means to provide greater flexibility to fleets while achieving significantly greater emission reductions. (Transcript from July 26, 2007 Board hearing, at 222-224.)

8)b) Violates California Environmental Quality Act (CEQA)

- 1. Comment:** Under the California Environmental Quality Act (“CEQA”), whether a rule has a significant, non-mitigable and adverse effect on the environment goes to whether the lead agency must prepare an Environmental Impact Report (“EIR”), or may simply make a negative declaration. With all due respect, AGC maintains that ARB cannot justify its suggestion that the off-road rule will not have such an effect. In addition, because ARB’s Initial and Final Statements of Reason under the California Administrative Procedure Act (“APA”) also serve as its environmental documents under CEQA, the distinction between an EIR and a negative declaration is less relevant here: ARB must still prepare its APA-required documents for its certified regulatory program, whether or not there is a significant, non-mitigable, and adverse effect on the environment. The ORD rule will have a significant and adverse impact on the environment even if, in the aggregate, it also has benefits for certain locations or certain pollutants. (Joseph)
- 2. Comment:** Although certified-program status exempts ARB from Chapters 3 and 4 of CEQA and from Public Resources Code §21167, Sierra Club v. State Bd. Of Forestry, 7 Cal.4th 1215, 1231 (1994), it must comply with the non-exempted portions of CEQA, Sierra Club v. State Board of Forestry (1994) 7 Cal.4th 1215, 123, and “must demonstrate strict compliance with its certified regulatory program.” Mountain Lion Foundation v. Fish & Game Comm’n, 16 Cal.4th 105, 132. (Joseph)

Agency Response: Despite the commenter’s suggestion that under CEQA, ARB must prepare an EIR or make a negative declaration, it properly recognizes that ARB regulations are part of a certified regulatory program under Public Resources Code § 21080.5. The California Resources Agency has certified ARB’s regulatory programs; accordingly, ARB is not required to prepare either an EIR or a negative declaration. (Title 14, CCR, §§ 15250 and 15251.) Rather the detailed Initial Statement of Reasons/Staff Report, Technical Support Document (TSD), and responses in this FSOR, serve in place of the EIR/negative declaration. (Title 14, CCR, §§ 15002(l) and 15252.) Those documents address

the anticipated environmental impacts from this regulation, and ARB has determined that the regulation will cause no reasonably foreseeable environmental harm. (See Staff Report, chapter VI, and TSD, chapter XI.) Having found that the regulation will not cause any foreseeable harm, but rather result in environmental benefits for the State, ARB was not under an obligation to do any further analysis of reasonably foreseeable mitigation measures or alternative means of compliance with the regulation. (Cf. Mountain Lion Foundation v. Fish & Game Comm'n, 16 Cal.4th 105, 134 ["the Commission did not satisfy the program's directive to assess feasible project alternatives and mitigation measures. The Commission's review procedures prohibit the Commission from adopting proposed regulations "if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment. . . ." (Emphasis added.] Having conducted a diligent environmental analysis in the Staff Report and TSD, having fully addressed all environmental issues raised in this FSOR and having filed a notice of final action and written response to significant environmental issues raised with the Secretary of the Resources Agency, ARB has fully fulfilled its responsibilities under CEQA. (Title 14, CCR, § 15252 and title 17 CCR §§ 60005-60007.)

- 3. Comment:** As explained in prior AGCA and other industry comments, the off-road rule will constrict the sizes and thus capabilities of individual California construction company fleets. For example, when existing used equipment loses some of its resale value and the off-road rule requires companies to purchase newer equipment, those twin factors will compel many companies to downsize their fleets. Downsized fleets, in turn, either cannot bid on projects or will take longer to complete the same project with less equipment. Individual projects that take longer will thus cause more automobile idling, more congestion, and more related worker trips to the area. Further, shrinking a company's fleet (e.g., going from two scrapers to one scraper) will create discrete project delays, thereby increasing the time to complete essential infrastructure and other important projects (e.g., restoring and repairing highways and bridges to relieve transportation congestion).

Recognizing that the most significant cause of traffic congestion is roadway bottlenecks, the off-road rule will lead to increased levels of transportation-related pollutants such NOx, PM, and volatile organic compounds because vehicles caught in stop-and-go traffic emit far more of these pollutants than they do operating without frequent braking and acceleration. What is more, in its Technical Support Document's discussion of traffic impacts that the ORD rule will cause, ARB aggregates the traffic impact statewide, without considering the localized effects that the ORD rule will cause. Specifically, ARB reasons that if the ORD rule's assumed 0.3% increase in construction costs would cause 0.3% fewer lane-miles of construction in California and thus 0.3% more idling

statewide, then that increase would not offset the ORD rule's emission reductions. See Technical Support Document, page 142. ARB's analysis of environmental impacts is inadequate: CEQA does not allow project sponsors to trivialize significant local environmental effects by aggregating them statewide. (JOSEPH)

Agency Response: Commenter may be correct that the regulation could affect the size of some fleets, which may, in turn, affect whether a fleet elects to compete for certain projects or may, if a fleet takes on a project, take longer for it – if it has fewer pieces of equipment available – to complete a project. While this may be true, it is speculative to assume that this translates into “more idling, more congestion, and more related worker trips to the area.” The fact that some fleets may become smaller does not mean that the projects will not be done and done on time. . First, a smaller fleet will continue to have the option of renting, on a short term basis, equipment to meet its particular needs, thus providing them with the equipment they need to complete a specific project. Also, a smaller fleet may not be able to compete successfully for larger projects, this is not to say that there will be no successful bidders for the projects and that the projects will be delayed and perhaps not completed. The decisions on what size fleets will be allowed to bid on a project and what size fleets must be to successfully win a bid are matters controlled by the developer or lead agency of the project, and not this regulation. Instead of using one fleet on a project, a developer may decide that two or more fleets are necessary to meet the scope and timelines of the project. Individual projects must have independent CEQA review, and any foreseeable environmental effects of those projects must be addressed therein, not here.

ARB's analysis of foreseeable environmental effects as set forth in the TSD was reasonable. To do as the commenter suggests – to consider each and every potential local project – would be both speculative and a Herculean, if not an impossible, task. As stated, the environmental impact of local projects requires a project-specific CEQA analysis.

See also the response in section III-A-3)f)iii) of this FSOR for a discussion of the regulation's impacts on infrastructure projects.

4. **Comment:** Public Resources Code §21092.1 requires an agency to re-notice an EIR when significant new information is added to an EIR prior to certification; Gov't Code §§11346.5, 11346.8(c) (requiring public notice of proposed regulatory language as part of the “EIR” for ARB's certified regulatory program); see also *Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal.3d 553, 567-68 (1990) (lead agency must consider entire administrative record on environmental effects). Here, ARB's revisions to the regulatory text, as well as its addition to the administrative record, clearly constitute significant new information.

Public Resources Code §21091(a) requires a minimum of 30 days public notice of a draft EIR and 45 days' notice if the agency submits the draft EIR to the State Clearinghouse within the Office of Planning and Research. See also Pub. Resources Code §21091(b) (20 days minimum notice for negative declarations, with 30 days minimum required if submitted to the State Clearinghouse). (JOSEPH)

Agency Response: See response to comments 3 and 4 above. ARB has fully complied with the notice requirements of Pub. Resource Code §§ 210912 through 21092.1. ARB's Staff Report and TSD were publicly made available more than 45 days before the May 25, 2007 hearing and more than 100 days prior to the date the Board reconvened on July 26, 2007, to approve the regulation for adoption. Additionally ARB issued three additional notices to stakeholders to solicit comments on subsequent modifications that were made to the regulations. These modifications included provisions that would achieve supplemental NOx reductions under the Surplus Off-road Opt-in for NOx program (SOON), which was fully considered by the Board at the July 26, 2007 hearing. In Resolution 07-19, the Board determined that the regulation, including the benefits from the SOON program, would not have an adverse effect on the environment. Finally, Public Resource Code § 21092(b)(3) provides that the notifications requirements of the Code "shall not be construed in any manner that results in the invalidation of an action because of the alleged inadequacy of the notice content, provided that there has been substantial compliance with the content requirements. . ."

5. **Comment:** To enable other state agencies to review and comment on proposed projects, Public Resources Code §21082.1(c)(4) requires state agencies like ARB to submit their draft environmental documents to the State Clearinghouse. See Pub. Resources Code §21082.1(c)(4)(A)(i). The state-agency review period begins on "the date that the State Clearinghouse distributes the document to state agencies," Pub. Resources Code §21091(c)(2), which has not yet occurred. Significantly, ARB's shortened notice period has significantly prejudiced the Association of General Contractor's ability to respond to ARB's proposal. Further, CEQA requires ARB to consult with federal, state, regional, and local public agencies (including transportation planning agencies) before adopting regulations that (a) affect California's transportation infrastructure, (b) regulate off-road equipment leased, owned, or contracted for by California state and local agencies, including trustee agencies, and (c) regulate federally preempted vehicles. See 14 Cal. Code Regs. §15086(a)(2)-(3), (5); Pub Resources Code §§21080.3(a); 21080.4, 21092.4(a). Moreover, "informal contact" does not constitute "required consultation." Pub Resources Code §21080.3(a). (Joseph)

Agency Response: As a certified regulatory program, ARB does not issue draft EIRs, but has provided affected state and local agencies with notice of the

regulation and has made all pertinent information regarding the regulation and its environmental impacts available to affected agencies and the public in general. Additionally, ARB has consulted with and solicited comments from affected state and local agencies, including the Business, Transportation and Housing Agency, CalTrans, local air districts, cities, counties, and municipalities. The extensive outreach conducted during development of the regulation is described in Chapter III, Section B of the Technical Support Document and in the responses in section III-A-16(h) of this FSOR.

6. Comment: Under CEQA, the lead agency must certify that “[t]he final EIR was presented to the decision-making body of the lead agency, and that the decision-making body reviewed and considered the information contained in the final EIR prior to approving the project.” 14 Cal. Code Regs. §15090(a)(2) (emphasis added). Because CEQA requires that the Board act on ARB’s EIR-equivalent, the staff-prepared revisions do not meet CEQA’s requirements. Significantly, Board approval is not an empty procedural formality. The ARB staff has omitted several key issues from their analysis, which warrant the Board’s attention:

- ARB’s staff-prepared health analysis relied on an analysis by C. Arden Pope III and colleagues (see Technical Support Document, App. C, pp. at 1, 3) without reporting on a critical review of Dr. Pope’s analyses published in the Journal of the Air & Waste Management Association in October 2006. Compare *id.* and C. Arden Pope III & Douglas W. Dockery, “Health Effects of Fine Particulate Air Pollution: Lines that Connect,” *Journal of the Air & Waste Management Ass’n*, 56:709-742 (June 2006) with Judith C. Chow, et al, “Health Effects of Fine Particulate Air Pollution: Lines that Connect--Critical Review Discussion,” *Journal of the Air & Waste Management Ass’n*, 56:1368-1380 (Oct. 2006). Even if ARB lawfully could select from among two expert analyses or find the pair mutually inconclusive, it is arbitrary simply to ignore dissenting expert opinion.
- ARB’s staff-prepared health analysis assumes that diesel exhaust has no safe threshold concentration. See Technical Support Document, at 199 (“Diesel PM is a carcinogen, and – as such – has no safe threshold below which there is no risk”). As explained in AGC’s initial comments, however, the data are inconclusive on that issue, with rat data suggesting a threshold but also suggesting (without establishing) that that data may not bridge to humans. See Air Resources Board & Office of Environmental Health Hazard Assessment, “Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant,” at ES-27 (Scientific Review Panel Apr. 22, 1998) (“It has been suggested that information based on the rat data suggested the presence of a threshold. However, the same data suggests that the rat data may not be relevant to humans.”) (emphasis added). Before ARB directs the public to spend what even ARB acknowledges as billions of dollars, ARB should conduct – or allow industry, other government, or non-

governmental organizations the opportunity to conduct – testing to establish whether diesel exhaust indeed has a threshold below which exposure does not cause cancer. (JOSEPH)

Agency Response: As previously stated, ARB, having a certified regulatory program, does not do draft EIRs. EIR-equivalent documents were presented to the Board and considered before the Board approved the regulation for adoption. Prior to the Executive Officer adopting the final regulation as delegated by the Board, ARB prepared this FSOR document addressing all relevant environmental comments that have been raised and has provided the required Notice of Decision and Response to Significant Environmental Issues to the Secretary of the Resource Agency.

With regard to the first bulleted item above, we believe the health analysis in the Staff Report and Technical Support Document is valid and accurate. For an explanation of why, please see the see responses in section III-A-1)c) of this FSOR.

For discussion of the second-bulleted item above, see response to comment 24 in Chapter III-A-19 of this FSOR. Assuming that the commenter is correct and that the EIR-substitute documents did not include the information or analysis claimed, ARB does not understand how such information is relevant to a CEQA inquiry and the Board's determination that the regulation, as adopted, will not result in foreseeable adverse environmental impacts. Both contentions seem to raise questions that the regulation, as adopted, imposes unnecessary and overly stringent emission standards and that ARB should have adopted standards that were less stringent. The fact that ARB adopted more stringent standards in no way undermines its finding that the regulation would not have adverse environmental impacts. Indeed, common sense would dictate that the more stringent the emission standards, the greater the environmental benefits the regulation will achieve.

8)c) Geographical Restrictions

- Comment:** As currently drafted, the proposed off-road rule already contemplates geographic variations in its legal requirements. For example, proposed §2449.1(a) and §2449(c)(6) exempt “Captive Attainment Area Fleets” from NOx requirements. To avoid having its regulations lag behind areas’ attaining (or falling out of attainment with) applicable ambient air quality standards, ARB should use a performance standard (rather than an enumeration of counties) in its definition of “Captive Attainment Area Fleet.” For example, the definition could exempt any county having attained national ambient air quality standard (“NAAQS”) for ozone. Given the limited availability of higher-tier new and used vehicles (see Section III.B.2, infra) and the limited statewide resources for repowering and retrofitting (see Section III.A, infra), ARB should consider limiting the scope of the off-road rule to those geographic

areas that will not attain the NAAQS by the applicable attainment deadline without the emission reductions from the off-road rule (e.g., the South Coast and San Joaquin air basins). Although it has not yet adopted a geographically limited vehicular standard, ARB considered adopting the South Coast Air Quality Management District (“SCAQMD”) fleet rules as SCAQMD-specific ARB standards in the aftermath of the Supreme Court’s decision in Engine Mfrs. Ass’n v. SCAQMD, 541 U.S. 246, 252-55 (2004). As it concluded then, ARB has the authority to adopt geographically limited vehicular standards. See also 13 Cal. Code Regs. §2610 (pilot program in South Coast air basin). As signaled above, geographic limitations would have several advantages over statewide regulations:

- Geographic limitations would target the emission benefits to the areas that most need them to accomplish the limited purpose for which Congress has authorized ARB to act outside of federal preemption (namely, attainment of the NAAQS);
- Moreover, by focusing and directing the limited higher-tier vehicles, retrofit/repower capacity, and public and private financing to those areas, ARB would avoid the massive strain that statewide regulations otherwise would place on the foregoing limited resources. Thus, those resources not only would go where most needed, but also would go there more easily than if those areas faced statewide competition for limited resources.
- Finally, by avoiding the adverse financial, social, and environmental impacts of the off-road rule in areas that do not need the off-road rule to attain the NAAQS (or other applicable threshold(s) that ARB selects), a geographically focused ORD rule would meet ARB’s obligation to minimize adverse economic impacts and ensure feasible standards. (JOSEPH)

Agency Response: See Agency Response to comment 34 in Chapter III-A-19 of his FSOR for an explanation of why the Board did not adopt a regulation limited only to specific geographic areas. Regarding the definition of Captive Attainment Area Fleet, we based the definition on a fixed list of counties to keep the definition static over time. We did not base the definition on a potentially shifting attainment status because it would be chaotic and difficult for fleets to plan if their requirements could suddenly change if the attainment status of their county changed. If we had done that, fleets could be exempt from NOx requirements one year, and subject to them the next.

Appendix A: JOSEPH Comment

B. Direct Emission Impacts from Life-Cycle Regulation

In its environmental analysis, ARB assumes that the emissions avoided by the ORD rule's idling restriction will offset the carbon dioxide ("CO₂") increase from the ORD rule's fuel penalty. *See* Technical Support Document, at 133, 147, 164-65 & App. I-1 to -2. In its analysis, however, ARB does not consider the life-cycle emissions from the manufacture, delivery, installation, use, and servicing of the controls that the ORD rule will impose. If ARB properly considered the life-cycle emissions, it would find that CO₂ emissions increase significantly. *See* Naylor Affidavit, ¶11 (finding increase of 393,430 metric tons per year in 2020) (Attach. 4). For CO₂ and global warming, moreover, emissions outside California have precisely the same environmental effect on California as emissions within California. Accordingly, ARB should consider the full life cycle of global-warming emissions that its ORD rule will cause, including not only the operation of ORD-required equipment in California but also the manufacturing, delivery, and service of that equipment.

METHODOLOGY, ASSUMPTIONS, AND CALCULATIONS IN SUPPORT OF AFFIDAVIT OF MICHAEL H. NAYLOR

My findings are explained and documented in this section. This analysis estimates that greenhouse gas emissions that will result from the California Air Resources Board's (ARB) off-road, in-use diesel (ORD) rule. Emission estimates generally use an emission factor defined as the emissions per unit (e.g., emissions per year per machine) and a population number (e.g., the number of machines). The emission factor is multiplied by the population to yield emissions per unit of time. In support of my analysis and calculations, I collected various sources from the U.S. Environmental Protection Agency (EPA) and ARB, as available, and also developed my own set of assumptions. I compiled my intermediate calculations and converted the totals from English to metric measurement systems.

Background

In July 2007, ARB adopted regulations to reduce emissions of particulate matter (PM) and nitrogen oxides (NO_x) from diesel-powered, off-road equipment currently in use. Based on my evaluation and careful analysis of the technical documents accompanying this rule, it appears that ARB has overlooked several sources of greenhouse gas emissions that would result from the actions (or "life-cycle" steps) necessary to comply with this new engine emissions standard.

In support of its rulemaking effort, ARB issued a staff report in April 2007, titled *Staff Report: Initial Statement of Reasons for Proposed Rulemaking*. Chapter VI, Section C of the report discusses the effect the regulation would have on global warming and greenhouse gas emissions. Specifically, Section C acknowledges that greenhouse emissions under the rule would increase

by as much as two to four percent, due to the fuel economy penalty that would result from the required use of cleaner engines and aftertreatment devices. However, the staff report goes on to find that this increase would be mitigated by the reduction in both black carbon emissions and carbon dioxide (CO₂) emissions that would result from the idling limits imposed by the rule.

The climate change estimates offered by ARB address only the approximate emissions benefits associated with reduced idling (analyzed in the figures and table below as Step 1) and the emissions outputs from the extra fuel consumption that would result from the drop in fuel economy, as caused by the exhaust back pressure of the diesel particulate filters used in the aftertreatment systems (analyzed in the figures and table below as Step 2).

ARB has failed to account for significant sources of greenhouse gas emissions that would result from the intermediate, life-cycle steps necessary to comply with the off-road diesel rule.

Both ARB and EPA rely on the concept of a life-cycle analysis when preparing a greenhouse gas inventory. Similarly, by analyzing the life-cycle steps for complying with ARB off-road rule, I have identified the following twelve operations or steps that result in the release of greenhouse gas emissions:

1. Excessive idling (according to ARB estimates)
2. Fuel-economy penalty from the ORD rule's aftertreatment requirements (according to ARB estimates)
3. Manufacture of raw steel materials to manufacture off-road machines (i.e., fabrication of the engines + equipment frames)
4. Fabrication of non-steel parts for off-road machines
5. Shipment of the fabricated parts to the factory for manufacturing of the machines and engines

6. Shipment of new machines from the factory to dealership
7. Fuel consumption due to transport of the machines to a retrofit facility for installation of aftertreatment systems
8. Regeneration of the diesel particulate filters (DPFs)
9. Manufacture of urea used in the selective catalytic reduction (SCR) aftertreatment systems
10. Distribution of urea by supply trucks to fleets for replenishing urea in the SCRs
11. Urea reaction with NOx in the SCR systems
12. Fuel consumed by service trucks that are used by technicians to clean and maintain the DPFs.

Assumptions

In order to analyze and estimate CO₂ emissions in 2020, I made the following assumptions about the California construction fleet in 2020:

- Turnover: Approximately 57.5 percent of off-road fleet are new (post 2007) machines; 20 percent of the new machines in operation are the result of natural fleet turnover.¹
- Aftertreatment (2020): Approximately 100 percent of the off-road fleet operating in 2020 will have aftertreatment devices. (This is evident when comparing EPA's Tier 2, 3 and 4 off-road engine standards with the ARB's off-road emissions targets for 2020.) All aftertreatment systems are designed for both PM and NOx reduction, meaning they have both diesel particulate filters and selective catalytic reduction devices.

¹ Richard J. McCann, Ph.D., M.Cubed, personal communication, December 20,2007.

- Aftertreatment (2008-2013): Approximately 71.4 percent of the fleet will retrofitted with aftertreatment devices. This is based on the estimate that 28.6 percent ($100\% - 28.6\% = 71.4\%$) of the fleet after 2013 will be new machines with factory installed aftertreatment. The 28.6 percent figure is the difference between a 28.9 percent turnover in 2013 and a 57.5 percent turnover in 2020.²
- Aftertreatment (2014-2020): Approximately 28.6 percent of the fleet has factory installed aftertreatment. (See paragraph above.)
- Repowers: The percentage of repowered machines in the fleet in 2020 is negligible.³

Methodology

For each step, I extrapolated the emissions per machine to statewide emission totals. To do so, I multiplied the population of machines by the emissions per machine and converted that figure to statewide CO₂ emissions in units of metric tonnes per year.

The staff analysis of the greenhouse gas impacts of the off-road rule suggests that the savings in fuel resulting from the rule's idling limits will reduce CO₂ emissions (61,640 metric tonnes per year) by at least the same magnitude as the increase in CO₂ emissions (50,960 metric tonnes per year) resulting from the fuel-economy penalty brought about by the rule's aftertreatment requirements. (This amounts to a 2 percent drop in fuel consumption due to idling limitation, and a 2 percent increase in fuel consumption due to poorer fuel economy).

However, my analysis of the estimated emissions increases shows that the increased emissions

² Richard J. McCann, Ph.D., M.Cubed, personal communication, December 20, 2007.

³ Richard J. McCann, Ph.D., M.Cubed, personal communication, December 21, 2007.

due to the ORD rule (455,770 metric tonnes per year) are about eight times the amount that would be offset by a reduction in emission from the idling prohibition.

A detailed breakdown of the estimated annual emissions of CO₂ in the year 2020 – associated with the life-cycle steps of the California off-road rule – appears in the table and figures. A detailed analysis of each life-cycle step follows.

My work is strongly supported by EPA and other peer-reviewed data and findings; the most pertinent information is attached. In cases where published data do not exist, assumptions were based on best engineering judgments and properly noted.

Summary of Results

In summary, I estimate the overall greenhouse emission impact of the ORD rule will be an increase of 394,040 metric tonnes per year of CO₂ emissions in the year 2020. A significant portion of the impact derives from the manufacture of the machine parts, transporting the machines, and manufacturing the urea for the SCR systems. These emissions occur whether or not the machine is even being operated. The emissions from each step are listed in Table 1 and are illustrated in the pie and bar charts in Figures 1 and 2, respectively.

**Table 1 – Estimates of Annual CO₂ emissions from
Various Steps in the Off-road Equipment Life Cycle**

Step	CO ₂ per average machine (pounds/year)	machine population	Total CO ₂ Emissions (metric tonnes/year)
1.	825.6	164,250	-61,640
2.	766.9	146,180	50,960
3.	9,570	61,594	267,930
4.	1580	61,594	44,250
5.	49.5	61,594	1,390
6.	196	61,594	5,490
7.	93.3	117,270	4,970
8.	28.1	146,180	1,870
9.	464.3	146,180	30,850
10.	546	146,180	36,280
11.	106	146,180	7,040
12.	70	146,180	4,650
Total	--	--	394,040

Figure 1- Estimated 2020 CO₂ Emissions Associated with Life Cycle Steps of ARB ORD (excludes idling benefit)

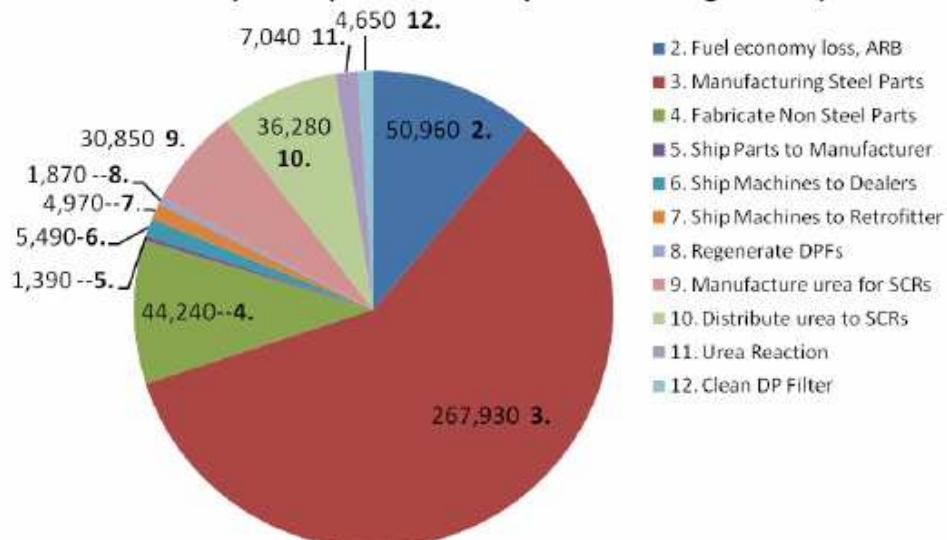
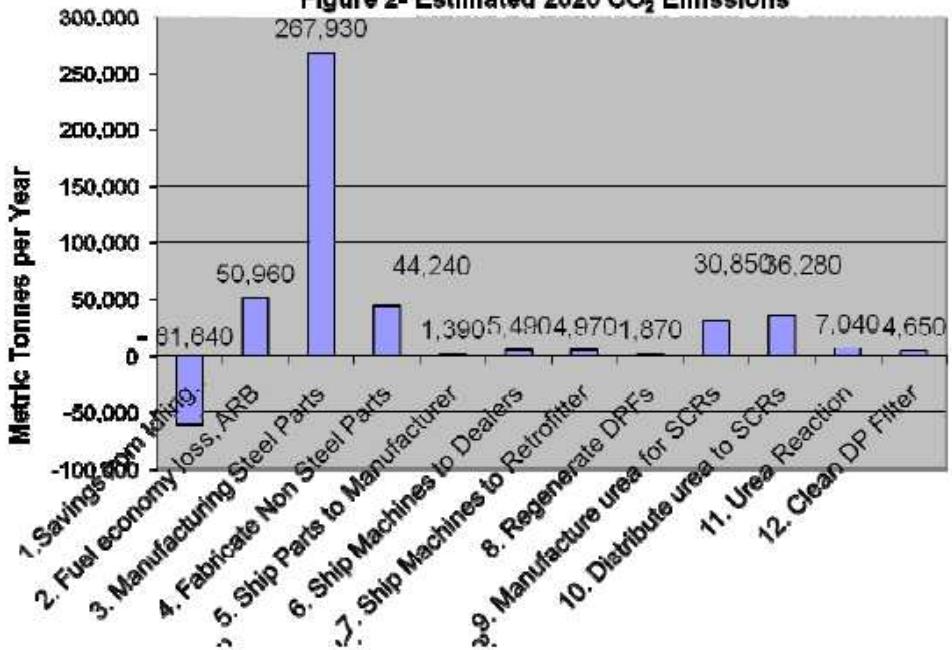


Figure 2- Estimated 2020 CO₂ Emissions



Step 1: Emissions from Excessive Idling

Pounds per Average Machine

In an addendum to the Initial Statement of Reasons, titled *Technical Support Document: Proposed Regulation for In-use Off-road Diesel Vehicles* (April 2007), ARB provides additional supporting materials. In Appendix I “Climate Change Impacts of the Off-road In-Use Regulation” of the technical support document, ARB attempts to quantify the anticipated change in CO₂ emissions that would result from the combined use of cleaner engines and aftertreatment devices, coupled with the limitation on idling. According to Table 3 in Appendix I, idling CO₂ emissions in 2000 were 61,560 metric tonnes, (not MMT as reported in Table 3), apportioned among 164,250 machines .

Calculation

61,560 metric tonnes/yr x 2200 lbs/metric ton/164,250 machines = 825.6 pounds CO₂ per year per machine.

Population of Machines

According to page I-4, there were 164,250 off-road diesel machines statewide as of 2000. This analysis does not consider growth

Metric tonnes per Year

825.6 lbs/yr/machine x 164,250 machines x 1 met ton/2200 lbs = 61,640 metric tonnes per year

Step 2: Fuel Economy Penalty from Aftertreatment Device

Pounds Per Average Machine

ARB states that the fuel economy penalty is equivalent to 2 percent of annual fuel consumption of the machine (see page I-2). According to Appendix I, Table 3, the average machine consumes 1,826 gallons of diesel per year (300,000,000 gallons/yr/164,250 machines). Appendix

I contains the conversion factor for converting one gallon of diesel fuel to CO₂ during combustion: 21 lbs CO₂ per gallon of fuel.

Calculation

1826 gallons per machine x 2% x 21 lbs CO₂ per gallon = 766.9 pounds per year/machine

Population of Machines

To meet the 2020 target levels, I assumed that 100 percent of the off-road machines operating in 2020 will have aftertreatment. Machines manufactured after 2013 will have factory installed aftertreatment. The construction industry estimates that the natural turnover from 2013 to 2020 is 11 percent (91.1% remaining inventory in 2013 – 80.1% remaining inventory in 2020, per Richard J. McCann, Ph.D., M.Cubed, personal communication, December 21, 2007.)

As indicated in Table 3, the population in 2000 is 164,250.machines. The percentage of machines that will have aftertreatment that is not due to turnover will be 89 percent. The net machine population using aftertreatment required by the regulation is $0.89 \times 164,250 = 146,180$ machines.

Metric Tonnes per Year

766.0 lbs/yr/machine x 146,180 machine x 1 metric tonne/2200 lbs = 50,960 metric tones/yr

Step 3: Emissions from manufacturing steel to make new machines

Pounds per Average Machine

The manufacture of steel starts with the extraction of ore and transporting it to steel mill. One of the last steps is forging the steel material into the desired shapes for product use. As a proxy for

this process we are using the life-cycle analysis for a steel can.⁴

Assume that Caterpillar D6T Dozer is representative, composite machine. According to Caterpillar literature its mass is 22.8 tonnes. Assume that 18 tonnes of this machine is steel. The estimate of CO₂ emissions from steel and steel product fabrication can be estimated by using the factor for steel cans from Exhibit 2-2 of EPA's report.

There are 0.79 metric tonnes of carbon equivalent per ton of steel can product using the current mix of virgin and recycled inputs. There are 3.67 metric tonnes of CO₂ per metric ton of carbon equivalent(ratio of molecular weights). Therefore there are 2.90 metric tonnes of CO₂ per ton of steel can or 6380 pounds CO₂ per ton.

Calculation

18 tons of steel x 6380 lbs CO₂/ton/ 12 years= 9,570 pounds per year (averaged over 12 years).

Population of Machines

According to M.Cubed, the percent of new (post 2007) machines due to turnover from 2008 to 2020 is 57.5 percent. The construction industry's estimate of natural turnover by this time is 20 percent (or the remaining inventory is 80.1%). The accelerated portion of this is 37.5 percent (Richard J. McCann, Ph.D., M.Cubed, personal communication, December 21, 2007.) Using the

⁴ EPA has considered the life-cycle emission from steel can manufacture from virgin and recycled materials in *Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks*, (May 17, 2002) (available at <http://www.epa.gov/climatechange/wycc/waste/downloads/greengas.pdf>). A recent report – (see Ungureanu, C.A.; Das, S.; Jawahir, I.S., Life-Cycle Cost Analysis: Aluminum versus Steel in Passenger Cars; TMS Publication (The Minerals, Metals & Materials Society) 2007) suggests that the emissions factor for steel fabrication is 5.1 kg CO₂ per kg steel. Thus, according to the report, for a 371 kg steel frame, there were 1913 kg of CO₂), and use of 3.96 kg CO₂ per kg of

(Footnote cont'd on next page)

base population above of 164,250 machines, the number of new machines in the fleet is 61,594.

Metric Tonnes per Year

9,570 lbs/yr/machine x 61,594 machine x 1 met ton/2200 lbs = 267,930 metric tonnes per year

Step 4: Fabrication of non-steel components for off-road machines

Pounds per average machine

From the above EPA source, I assumed that the manufacture of heavy density polyethylene could be used as a proxy for estimating greenhouse gases from manufacturing the non-steel components. The HDPE factor, from Exhibit 2-2 is 0.49 MTCE per ton of product. This figure is based on a the non-steel mass of 4.8 tonnes (22.8 tonnes -18 tonnes).

Calculation

4.8 tonnes x 0.49 met tonnes C x 3.67 met tonnes CO₂/ met ton C/x2200 lbs /met ton/12 years = 1580 pounds per year

Population of Machines

This is the same at Step 3 above.

Metric tonnes per year

1,580 lbs/yr/machine x 61,594 machine x 1 met ton/2200 lbs = 44,240 met tonnes per yr

Step 5: Shipment of the fabricated parts to the factory for manufacturing the machine and engine

Pounds per average machine

Assume that the fabricated steel parts and non-steel parts are shipped by rail for 500 miles.

(Footnote cont'd from previous page.)

steel, is conservative.

Current diesel locomotive technology achieves 403 ton miles per gallon of diesel fuel (see <http://www.transportation.anl.gov/pdfs/RR/261.pdf>). Therefore the shipment 22.8 tonnes of parts requires $22.8 \text{ tonnes} \times 500 \text{ miles} / 403 \text{ ton miles/gallon} = 28.3 \text{ gallons}$. From page I-1 of Appendix I, "for every gallon of CARB diesel fuel used 9.96 kilograms of CO₂ is emitted. This equals 21 pounds per gallon. Over the 12 year life of the machine this is $28.3 \text{ gallons} \times 21 \text{ lbs CO}_2/\text{gallon} / 12 \text{ yr} = 49.5 \text{ pounds per year/machine}$.

Population of Machines

This is the same at Step 3 above.

Metric tonnes per year

$49.5 \text{ lbs/yr/machine} \times 61,594 \text{ machine} \times 1 \text{ met ton}/2200 \text{ lbs} = 1390 \text{ met tonnes per yr}$

Step 6: Shipment of new machines from factory to dealership

Pounds per average machine

Shipment from factory to dealership of new machine. The presumed manufacturer is Caterpillar, headquartered in Peoria, Illinois. Destination is central California, the one way distance is 1980 miles. The machine weight 22.8 tonnes See Step 3. The ton miles is 1485. Current locomotive technology achieves 403 ton miles per gallon See Step 5. The CO₂ conversion factor is 21 lbs CO₂ per gallon and the life is 12 years (Step 5).

Calculation

$22.8 \text{ tonnes} \times 1980 \text{ miles} / 403 \text{ ton miles/gallon} \times 21 \text{ lbs CO}_2/\text{gal} / 12 \text{ years} = 196 \text{ pounds per year}$

Population of Machines

This is the same at Step 3 above.

Metric tonnes per year

$196 \text{ lbs CO}_2/\text{machine/yr} \times 61,594 \text{ machine}/12 \text{ yr} / 2200 \text{ lbs/met ton} = 457 \text{ metric tonnes per year}$

Step 7: Fuel consumption due to machine transport to retrofit facility for installation of aftertreatment system

Pounds per average machine

For installation of DPF/SCR device, assume that class 8 flat bed truck is used with a fuel economy of 4.5 miles per gallon (this is default used by South Coast AQMD for their heavy duty on road truck modernization program). Assume that the round trip distance is 100 miles. The project life is 5 years for the retrofit which is the project life for repower/retrofits in the Carl Moyer Program proposed Guidelines.

Calculation

$$100 \text{ miles}/4.5 \text{ miles/gal}/5 \text{ yr} \times 21 \text{ lbs CO}_2 \text{ per gal} = 93.3 \text{ lbs/yr CO}_2.$$

Population of Machines

The ARB assumes that the turnover rate will increase from 28.9 percent in 2013 to 57.5 percent in 2020. (Richard J. McCann, Ph.D., M.Cubed, personal communication, December 20, 2007.) Therefore, post 2013 machines will account for 28.6 percent (57.5%-28.9%) of the fleet. Machines acquired after 2013 will have factory installed aftertreatment systems. The rest of the fleet will have retrofitted aftertreatment systems, or 71.4 percent of the fleet. This results in a retrofitted population of $0.714 \times 164,250 \text{ veh} = 117,270$ machines.

Metric tonnes per year

$$93.3 \text{ lbs/yr/machine} \times 117,270 \text{ machine} / 1 \text{ met ton}/2200 \text{ lbs} = 4970 \text{ metric tonnes per year}$$

Step 8: Regeneration of the diesel particulate filters

Pounds per average machine

The diesel particulate filter traps PM during routine operation. (Each filter collects 85% of the particulate that enters the emission control device. The particulate matter is carbonaceous.

During regeneration the carbon is oxidized by outside air to form carbon dioxide.) During regeneration the trapped PM is heated and oxidized to CO₂. According to the emission factors for the off-road rule, a Tier 3 engine has PM emission factor of 0.15 gram/bhp·hr. The Level 3 filter will retain 85 percent of the weight of Particulate Matter.

Assume that for every gram of soot regenerated to CO₂, that 2.96 grams of CO₂ are released.

This factor is the same as the gas to liquid mass ratio for diesel fuel which is 21 lbs CO₂ per gallon of diesel which weighs 7.1 pounds per gallon. From Table 3 of Appendix I of the off-road rule, the average machine consumes 1,826 gallons of diesel per year (300,000,000 gallons/yr/164,250 machines). Each gallon generates 18.5 hp hr of work using the Moyer guidelines conversion factor.

Calculation

$$1826 \text{ gallons} \times 18.5 \text{ hp hr/gal} \times 0.15 \text{ gram PM /bhp·hr} \times 85\% \times 2.96 \text{ gram CO}_2/\text{gram PM} / 454 \text{ gm/pound} = 28.1 \text{ pounds CO}_2 \text{ per year/machine}$$

Population of Machines

From Step 2 above, the machine population with aftertreatment which results from the regulation (not the machines which have aftertreatment naturally) is 146,180 machines.

Metric tonnes per year

$$28.1 \text{ lbs /yr/machine} \times 146,180 \text{ veh} / \times 1 \text{ metric ton} / 2200 \text{ lbs} = 1,850 \text{ metric tonnes per year}$$

Step 9: The manufacture of urea for use in the individual aftertreatment system

Pounds per average machine

The following information is obtained from EPA's Greenhouse Inventory (online at <http://www.epa.gov/climatechange/emissions/usinventoryreport.html>) Chapter 4, Industrial Processes, Ammonia and Urea Application. According to page 4-10, ammonia and CO₂ are

used as raw materials in the production of urea ($(\text{NH}_2)_2 \text{CO}_2$). Emissions of CO₂ occur during the production of ammonia. The manufacture of each pound of urea, releases 3.2 pounds of CO₂.

A Tier 3 engine sends 3 gram /bhphr of NO_x to the SCR system. One half of a molecule of urea (MW 60) is needed to neutralize one molecule of NO which is reported as NO₂ (MW 46). Therefore 30 grams of urea neutralizes 46 grams of NO_x, or 0.65 grams of urea neutralizes one gram of NO_x. Consequently, three grams of NO_x requires 1.95 grams of urea. In one year the average machine uses 1826 gallons \times 18.5 hp hr/gal \times 1.95 grams of urea/bphr/454 = 145 pounds of urea/year

Calculation

$$145 \text{ lbs urea/year/machine} \times 3.2 \text{ lbs CO}_2 \text{ per pound of urea} = 463.3 \text{ lbs CO}_2/\text{yr/machine}$$

Population of Machines

This is the same as Step 8.

Metric tonnes per year

$$464.3 \text{ lbs CO}_2/\text{machine/yr} \times 146,180 \text{ machine} \times 1 \text{ met ton}/2200 \text{ lbs} = 30,850 \text{ metric tonnes/ year}$$

Step 10: Urea distribution by supply truck

Pounds per average machine

Fuel is consumed by supply or service truck which delivers urea on a weekly basis to the urea supply tank on the machine with the SCR unit.

Assume that one truck serves 20 machines per day and that it covers 100 miles per day. Assume that truck has fuel economy of 10 miles per gallon. Therefore it consumes 0.5 gallons per day per machine. Deliveries are made weekly so the diesel fuel used annually per machine is 26 gallons.

$$26 \text{ gallons} \times 21 \text{ lbs CO}_2 \text{ per gallon} = 546 \text{ lbs CO}_2 \text{ per year}$$

Population of Machines

This is the same as item 8.

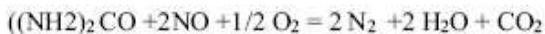
Metric Tonnes per year

546 lbs CO₂/machine/yr x 145,180 machine x 1 met ton/2200 lbs = 36,280 metric tonnes / year

Step 11: Reaction of urea

Pounds per average machine

When urea is injected into the Selective Catalytic Reactor CO₂ is released.



Continuing from the discussion at Step 9 ,a molecule of urea will release one molecule of CO₂ after the re action in the SCR. 60 grams of urea will generate 44 grams of CO₂. One gram of urea will generate 0.73 grams of CO₂. One pound of urea will generate 0.73 pounds of CO₂.

Calculation

145 lbs urea/ year/machine x 0.73 lbs CO₂ per lb urea = 105.9 pounds of CO₂ /yr/machine

Population of Machines

This is the same as Step 8.

Metric Tonnes per Year

106 lbs CO₂ per machine/yr x 146,180 machine x 1 met ton/2200 lbs = 7,040 met tonnes/ year

Step 12: Fuel consumed by service truck for technician to clean the DPF twice per year

Pounds per average machine

Assume that the service truck can clean four machines per day, driving 100 miles per day.

Assume that the truck has a fuel economy of 15 miles per gallon. Therefore each machine requires use of 1.67 gallons of fuel (100/15/4). With an emission of 21 pounds CO₂ per gallon, this results in 35.07 pounds per machine per cleaning. Based on twice per year cleaning, this

means 70.1 pounds per year.

Population of machines

This is the same as Step 8.

Metric Tonnes per Year

70 lbs/machine/yr x 146,180 machine x 1 met ton/2200 lbs = 4,650 metric tonnes per year

Construction Industry Compliance Costs

determine the cumulative impacts of recently enacted and proposed regulations on the industry.

The Analytic Steps for Estimating Compliance Costs

The objective research question is: What is the net present value of the fiscal costs to the construction industry from complying with ARB's proposed in-use off-road diesel vehicle rule? We estimated compliance costs by constructing an Excel spreadsheet model and then simulating several scenarios determined by values chosen for input parameters.

Construction Industry Cost Model Composition

The CICM relies on the same underlying data used by the ARB Staff in its analysis. However, the CICM analyzes the statewide fleet as a whole, rather than looking at individual fleets and then aggregating up as the Staff did. In this way, the CICM is able to determine accurately the incremental statewide changes in the fleet. Rather than trying to trace through every transaction by individual firms, the CICM assesses the difference between the "first" and "last" transactions in the compliance sequence triggered by the regulation. This difference represents the incremental equipment additions that must occur to decrease the number of Tier 0 and 1 vehicles and replace them with Tier 2, 3 and 4 ones. We do *not* assume that all turnover actions require purchase of a new piece of equipment—we simply ignore used market transactions because the net effect has little or no impact on statewide costs.

The CICM begins with the statewide emission inventory database and culls it down to construction equipment (which represents over 90% of the affected fleet). We added the new vehicle prices and retrofit costs developed by the Staff. In addition, we acquired the Staff's Access database model for its sample of fleets. This latter model was used by the Staff to simulate potential compliance strategies for specific fleets and then extrapolated to the statewide fleet.

We extracted from the Staff's database model the turnover and retrofit rates under the baseline (without regulation) and regulatory scenarios and calculated the net impacts from the regulation embedded in the Staff modeling. **This net turnover rate represents new equipment additions to the statewide fleet—the inverse interpretation is that this is the retirement rate for existing equipment.** The net additional turnover and retrofit rates implied from the Staff's model are shown in Table 1 below. For 2010 to 2016, the net turnover rate is accelerated to an average of 3.4%, which represents a 55% increase over the underlying turnover rate of 6.2% assumed in the Staff's emission inventory model, implying a total turnover of 9.8% (i.e., a 3.4% increase over both the 100% baseline and the 6.2% turnover). The average turnover rate decreases slightly to 2.5% for 2017 to 2020, and further to 2.0% for 2021 to 2030. The increase over the entire program is 2.5%, which translates to an implied total turnover rate of 8.9% (i.e., a 2.5% increase over both the 100% baseline and the 6.2% turnover), which is a 40% increase over the ARB's assumed historic rate. The retrofit rate is highest in the first year, and within three years, almost half of the statewide fleet is presumed to be retrofitted.

C. Summary of Comments and Agency Responses – Second Notice of Modified Text

A table listing all commenters who submitted comments in response to the second notice is set forth below, identifying the date and form of all comments that were timely submitted. Following the table is a list of those comments that were not pertinent to the regulation, and a list of the comments that were wholly in support of the regulation.

Following those lists is a summary of each pertinent objection or recommendation, together with an agency response providing an explanation of how the proposed action has been changed to accommodate the objection or recommendation or the reasons for making no change. The comments have been grouped by topic whenever possible. Comments not pertinent to the modifications proposed in the second 15-Day Notice are not summarized below. Additionally, any other referenced documents are not summarized below.

Table III-C-1 below lists the comments received during the comment period for the second 15-day Notice.

Table III-C-1 Comments from During the Comment Period for the Second 15-day Notice

Reference Code	Commenter	Affiliation	Date/Time Added to Database
WELDON3	Birch, Weldon	CSDA, CMCA, EUCA	February 11, 2008
SHAWM3	Shaw, Mike	Shaw, Mike	February 26, 2008
NWS3	Thomas, James	Nabors Well Services Co.	February 26, 2008
YOUNGS	Young, Steven	Allen Lawrence & Associates Insurance	February 27, 2008
MACINTOSH	MacIntosh, Don	MacIntosh, Don	February 28, 2008
EUCA6	McGovern, Tara	EUCA	March 3, 2008
HUNTINGTON	Huntington, Dan	Huntington, Dan	March 3, 2008
ALBAY2	Miles, Gary	Albay Construction Co.	March 4, 2008
GC4	Sbaffi, Dave	Sbaffi, Dave	March 5, 2008

DALEY2	Daley, Michael	CSLB, CLCA	March 5, 2008
CAMARILLO6	Porcher, Dave	Camarillo Engineering Inc.	March 6, 2008
CLOUD1	Cloud, Jon	Cloud, Jon	March 6, 2008
ARTBA3	Goldstein, Nick	American Road and Transportation Builders Association	March 6, 2008
APA	Joseph, Lawrence	APA Watch	March 6, 2008
ARA4	McClelland, John	American Rental Association	March 6, 2008
SCAQMD3	Wallerstein, Barry	Wallerstein, Barry	March 6, 2008
AGCA5	Pilconis, Leah	AGC of America	March 6, 2008
ATA3	Pohle, Timothy	Air Transport Association of America Inc	March 6, 2008
LACITY2	Hardison, Gretchen	Hardison, Gretchen	March 6, 2008
LEWISM3	Lewis, Michael	CIAQC & CBCC	March 6, 2008
CLOUD2	Cloud, Jon	Cloud, Jon	March 6, 2008
ECCO6	Rohman, Gary	ECCO Equipment Corporation	March 7, 2008

The following Reference Codes pertain to comments that were submitted in response to the second 15-day notice but were not pertinent to the second 15-day modifications:

Reference Code
ARTBA3
CLOUD1
CLOUD2
DALEY2
MACINTOSH
WELDON3
YOUNGS

1. 2nd 15-day SOON Comments

1)a) SOON Program Unfair to Small Businesses

- Comment:** I have a number of problems with the SOON program, the biggest of which are: The definition of a small fleet should not include any dollar volume limits. One contractor could do a huge dollar volume but own no equipment. Another contractor might not do much dollar volume but does operate many thousands of HP in old, dirty equipment. Because

small companies tend to own the older equipment, you are discriminating against the small business owner. At least give him a chance to slowly replace old equipment with newer equipment over a period of 10 years. Right now you are requiring us to repower or replace equipment with engines that won't comply with your regulation's pollution requirements because compliant engines are not yet available. As I said, contractors expect to get 20 years out of a piece of equipment. You are making us spend money on equipment that will become noncompliant in less than 10 years. It is a waste of money. Do not penalize us until we have a way to satisfy your requirements. (ALBAY2)

Agency Response: Small fleet owners are not required to participate in the SOON program under any circumstances. Consequently, there is no definition of a small fleet in the SOON program language. The definition of a small fleet in regards to the statewide off road regulation is described in section 2449(c)(25) of Attachment 1: Staff's Modified Text to the Original Proposal to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on Feb. 5, 2008. The small fleet definition does not currently include a "dollar volume" limit, or requirement that the fleet be a small business.

Small fleet owners may volunteer to participate in the SOON program if the local air district in which they operate equipment chooses to opt into the program, however only fleets with 20,000 horsepower or more are ever required to participate. If a fleet is not required to participate in the SOON program, but chooses to do so anyway, the fleet has no obligation to participate in the SOON program in any subsequent year.

The cost to replace, repower, and retrofit equipment previously modified or replaced to comply with the regulation is discussed in the response to section III-A-3)a)i)2) of this FSOR.

1)b) SOON Adds Cost

- 1. Comment:** By failing to require air districts to fully fund SOON projects and by mandating participation in SOON, ARB piles SOON-mandated costs on top of the costs already imposed by ARB's Portable Equipment Registration Program, its underlying off-road in-use diesel rules, its smoke-inspection rules, and its upcoming on-road in-use diesel rules. (APA)
- 2. Comment:** These regulations are impacting the construction industry at a time when many businesses are already facing financial challenges. Page 61 of the April, 2007 Initial Statement of Reasons for Proposed Rulemaking states, "Staff also considered requiring higher turnover rates and more stringent NOx averages, but the higher costs would likely be more than the industry could bear." This document is dated prior to the introduction of the SOON program which includes the higher turnover

rates and more stringent NOx averages staff believes the industry cannot bear. By staff's own estimation the SOON will produce an untenable economic burden without even considering the other regulations the construction industry is faced with including the Portable Equipment Regulation Program (PERP) and the upcoming On-Road (In-Use) Diesel regulation which promises to be even more costly than the Off-Road Diesel Regulation. Most contractors will not be able to afford the compliance costs of the base Off-Road Diesel Regulation let alone the added costs of the SOON program. The requirement to provide matching funds will be out of reach for most contractors. The construction industry is facing a severe economic downturn which makes the survival of many companies a difficult challenge. (EUCA6)

3. **Comment:** Including SOON as an over-compliance component of the off-road in-use diesel regulation makes an already complex and confusing regulation extremely difficult for a layperson to understand as well as being over burdensome to comply with. Because emission reductions created by SOON projects cannot be used in the calculation of a state-wide fleet average, fleets will have to spend additional dollars to meet target goals than they would have in the absence of SOON. This is placing additional burden on an industry that already is facing a depressed market and will struggle to meet the requirements of the state-wide regulation. (GC4)
4. **Comment:** To expect contractors to have additional resources available to meet the additional turnover requirements of the SOON program is unrealistic. We concur with the statement made by your staff in their April 2007 Initial Statements of Reasons for Proposed Rulemaking which read: "Staff also considered requiring higher turnover rates and more stringent NOx averages, but the higher costs would likely be more than the industry could bear." The SOON program will unfairly require contractors and fleet selected for funding to over-comply with the base regulation. SOON funded equipment will be counted in the base fleet calculations as a Tier 0 for the term of the project, just as if the repower or replacement never took place. To compensate for this, fleets will be forced to replace, repower, retrofit or retire additional equipment to overcome the higher emissions associated with the "Tier 0" SOON equipment. SOON will fund the most cost effective projects first, and the remaining base-rule equipment will be less cost-effective to replace, repower or retrofit, increasing the cost to comply for these fleets. (LEWISM3)
5. **Comment:** SOON is too costly for contractors. Most contractors will struggle to meet the CARB base rule compliance and will probably have to reduce the size of their fleets in order to meet the fleet averages because they will not be able to afford the turnover and retrofit requirements. The construction industry is subject to multiple rules for which cumulative

impact analysis has not been conducted. Most contractors in California own portable, off-road and on-road equipment in order to properly service their construction contracts. (HUNTINGTON)

6. **Comment:** Currently, our business is depressed. Our business is heavy earthmoving and we are running at about 12% of the volume we were doing two years ago. We are currently operating 21% of our fleet when weather permits. It is taking all of our resources just to stay in business now, and we don't expect significant work for at least two more years. To be mandated to spend money on this program would be a financial disaster and will put contractors out of business. (SHAWM3), (LEWISM3), (LEWISM4)

Agency Response: As discussed in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on Feb. 5, 2008, we acknowledge that the SOON program will have up-front costs for fleets. We recognize that although most of the SOON program costs will be funded by the air districts (according to existing funding guidelines such as those for the Carl Moyer program) and although participating fleets will see a long-term economic benefit from receiving SOON funding, there will still be up-front costs incurred by the fleets participating in the program in the year they receive SOON funding. As discussed further below, these costs include administrative costs, as well as the fleet's portion of costs for engine repowers or vehicle replacements. Fleets have to pay a portion of the repower or replacement costs because SOON will largely be funded with Carl Moyer program funds, which statute limits to just the incremental cost beyond normal business costs. Thus, fleets will be responsible for the portion of project costs that they would have faced anyway during the normal course of business.

Once each SOON project contract period ends, the participating fleet will realize an economic benefit in that it will essentially get back more than it contributed to participate in SOON because it will be able to credit actions funded by SOON toward fleet compliance with the off-road regulation. For example, if a fleet pays 15 percent of a SOON project repower cost and the remaining 85 percent is paid with SOON funding, once the contract period ends, the fleet gets to credit the repower toward compliance with the off-road regulation and therefore would need to spend less than it otherwise would for compliance with the off-road regulation. At the conclusion of all SOON project contract periods, the SOON program overall will have made the off-road regulation more affordable for participating fleets.

Although the SOON program will ultimately lessen the costs of compliance for participating fleets, the SOON program could also potentially increase the estimated cost of the off-road regulation in its initial years of implementation by a small amount (less than one percent). This is because we expect that the SOON

program will fund the most cost-effective projects in a fleet (such as older Tier 0 vehicles) earlier than they would be controlled through the statewide requirements in the off-road regulation. Because these vehicles will now be included in the SOON program, fleets will need to control less cost-effective vehicles (such as newer Tier 1 vehicles) for compliance with the off-road regulation. Even with the slight increase in the regulatory cost of the regulation, the regulation remains cost-effective and is still within the cost-effectiveness range of previous measures adopted by ARB.

As discussed in the response in section III-B-9)b) in this FSOR, the detail of the SOON addition to the regulation is a direct response to industry requests that the regulation include the maximum amount of flexibility. The original proposal for increased stringency in non-attainment districts was a simple amendment that roughly doubled the amount of turnover required by large fleets and guaranteed no public funding, but did not require a significant change reporting procedures. The current SOON program is more detailed, but guarantees funding for projects needed to achieve surplus emissions reductions.

A detailed analysis of the initial cost and long term savings to fleets who participate in the SOON program in the South Coast Air District is available in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents, released on Feb. 5, 2008.

The effect of economic hardships imposed on fleet owners by shifts in the state economy is discussed in the response to section III-A-3)a)iii) of this FSOR, and the stringency of the regulation in regards to adding vehicles to an existing fleet is discussed in the response to section III-A-6)c)xii) of this FSOR.

1)c) Limit SOON to South Coast and San Joaquin

- 1. Comment:** The reporting requirements and application filing requirements of SOON are excessive and burdensome. It seems unjust to us that we must report our state-wide fleet and district fleet to every district that opts-in, must apply for funds, and must prepare and submit a compliance plan all before determining whether we have any machines that are even applicable to the SOON program. Isn't there a more direct way to determine if a machine meets the criteria of the SOON program? (GC4)
- 2. Comment:** SOON should not be open to all air districts. SOON was intended to assist the two air districts in California that need to meet the 2014 deadline to achieve compliance with the Federal PM2.5 standard. Both of those districts are approaching the program differently, and it will result in confusing and conflicting requirements for contractors who operate in multiple districts. Adding other districts to the regulation will only compound the confusion. (HUNTINGTON)

- 3. Comment:** The Board's decision to allow districts other than South Coast and San Joaquin to opt-in threaten to create a patchwork of regulations throughout the state, all with different compliance requirements. In allowing South Coast and San Joaquin Valley air districts to develop SOON programs, contractors operating statewide have at least three off-road diesel regulations to consider (the base regulation, the South Coast SOON regulation and the San Joaquin Valley SOON regulation). The prospect of allowing air districts beyond South Coast and San Joaquin to opt-in to the SOON program makes a bad problem worse. EUCA would like CARB to reconsider allowing air districts other than South Coast and San Joaquin Valley to opt-in to the SOON program. CARB should also require that South Coast and San Joaquin Valley harmonize the requirements of their SOON programs to facilitate contractor compliance.(EUCA6)
- 4. Comment:** Local air districts that "opt-in" to the SOON program must develop their own "administrative provisions...including, but not limited to, funding guidelines, compliance planning requirements, and reporting and monitoring requirements" to reduce NOx emissions from construction equipment operating in their district beyond what is required under the statewide off-road regulation. This provision appears to give local governments new authority to set their own unique emissions standards for off-road construction equipment. Allowing local governments within California to set engine emission standards could lead to dozens of different standards being used throughout the state.(AGCA5)

Agency Response: The Board directed the staff to allow all California air districts to opt in to the SOON program during the public hearings in Sacramento on July 26th and July 27th, 2008. Although we recognize that the SOON program increased the reporting detail required for fleets that operate in numerous air districts which choose to opt in to SOON, we are continuously working to ensure that the process is as direct and uncomplicated as possible. In the months after the regulation was adopted, we met with fleet owners and air districts to determine the reporting structure which would achieve the desired additional emissions reductions benefits with the least complexity for fleet owners. Although the regulation allows air districts to create their own guidelines for projects funded through SOON in their district, ARB will review the guidelines for statewide consistency and give final approval to all programs implemented by local air districts.

We have also ensured fleet owners that they will not be required to report any vehicle in more than one local air district. For each vehicle, the air district in which the vehicle predominantly operates will determine the necessity of complying with a SOON program. Whether or not the vehicle requires a submittal to the SOON program, its primary air district is based on the vehicle

hours of operation in that district. Therefore, a fleet will never have to submit SOON applications in multiple districts for the same vehicle.

Finally, the SOON program does not give local governments the authority to develop emissions standards for off-road equipment (as stated in comment AGCA5). The NOx targets for the SOON program are established in section 2449.3(d)(1)(C) of the ARB off-road regulation, and cannot be changed by participating air districts.

1)d) Change Fleet Size Provisions in SOON

- 1. Comment:** The SOON Program is unfairly targeted at large state-wide fleets (greater than 20,000 horsepower). We believe that the fleet categories should be consistent with the regulation as defined in section 2449(c)(25). More realistically, the program should target machines that will yield the reductions within the applicable district, regardless of size. (GC4)

Agency Response: We disagree that the SOON program unfairly targets large state-wide fleets. Fleets of any size may volunteer their most cost effective projects if their local air district opts in to SOON, and we anticipate that most air districts will select projects based on the cost effectiveness of the projects, not the size of the fleet submitting a SOON compliance plan. The SOON program limits mandatory involvement with the SOON program to fleets with 20,000 horsepower or more in order to reduce the reporting burden on smaller fleets with fewer employees. Larger fleets are more likely to have the resources to create and submit compliance plans and participate in the SOON program. Fleets with 20,000 horsepower or greater are also more likely to operate larger equipment, which will likely be eligible for the most cost effective emissions reduction projects.

1)e) SOON Reductions Not Counted in Statewide Regulation

- 1. Comment:** To include a program that provides incentive funding to create additional reductions of NOx sounds great. But, to make it mandatory and not allow industry to include the reductions created from SOON project towards their state-wide fleet average is wrong and unjust. This simply appears to be a strategy to circumvent a law (incentive funds can not be used to meet compliance of a regulation) that unfairly places the burden on the construction industry. (GC4)
- 2. Comment:** SOON contracts between local air districts and fleet owners may last up to seven years and during the contract period the equipment owner cannot account for the lower emissions from the SOON equipment with respect to the base regulation. (EUCA6)

Agency Response: Fleet owners who participate in the SOON program will receive credit towards the statewide off-road regulation after the SOON contract period ends. We disagree that fleet owners should receive credit towards the statewide off-road regulation for SOON funded projects prior to the end of the contract periods, as this could prevent the SOON program from achieving any emissions reductions surplus to those anticipated from the off-road regulation. The SOON program was intended to achieve additional emissions reductions, and a contract period during which actions funded by SOON are not counted toward the fleet's statewide average is necessary to achieve surplus emissions reductions.

1)f) Make SOON Voluntary

- 1. Comment:** There are numerous implementation problems with the SOON program as it is written and it needs to be changed because applying the Carl Moyer incentive funding requirements to a mandatory program make it completely unworkable. Specifically: SOON is not voluntary. Making the program voluntary for 2008 was the proper step to resolve the many issues that have arisen with the SOON program. We would recommend that it be made voluntary until 2012. (HUNTINGTON)
- 2. Comment:** Due to the application of the Carl Moyer requirements to the SOON program, contractors are expected to contribute from 15% - 50% of the cost of the re-power. This is simply impossible on top of the CARB low estimate of the cost of the regulation of \$3.4 billion. Making the program voluntary for 2008 was the proper step to resolve the many issues that have arisen with the SOON program. We still would recommend that it be made voluntary until 2014. (LEWISM3)
- 3. Comment:** The SOON program does not have an opt-out provision for fleet owners. NWSC's suggestion is to change the regulatory language to allow the opt-in and opt-out provision to the fleet owners that was given to the local air districts. (NWS3)
- 4. Comment:** The program should be completely voluntary. (ARA4)

Agency Response: For all California air districts aside from San Joaquin and South Coast, the SOON program can only be implemented as a voluntary program until 2010. After 2010, local air districts may choose to implement the SOON program on a voluntary basis. However, we believe in order to guarantee emission reductions, that local air districts must have the opportunity to decide if mandatory participation in the SOON program is needed. This is particularly important in the San Joaquin Valley and South Coast Districts, which face extremely challenging near-term SIP deadlines. In districts which opt to make the SOON program mandatory, fleet owners will still have the option to submit their SOON compliance plans as "High Priority", which will allow districts to

identify fleet owner that are volunteering to have their compliance projects completed as soon as possible.

1)g) Do Not Limit SOON to Tier 3 Repowers

- 1. Comment:** SOON is too restrictive. Unfortunately, the requirements proposed by the air districts that re-powers must be done from Tier 0 to Tier 3 engines, significantly reduces the pool of eligible equipment. We would recommend that the SOON program be replaced with a replacement or scrappage program aimed at just the five specific pieces of equipment that can meet the re-power requirements. SOON applies to equipment that cannot qualify for the Moyer program. Many contractors will be in the SOON program by reason of their 20,000 horsepower fleet and 40% Tier 0 and Tier 1 machines, but that does not mean that they will own equipment that can be re-powered under the Moyer requirements.
(HUNTINGTON)

Agency Response: The restrictions on repowers from Tier 0 to Tier 3 are part of the Carl Moyer Program guidelines adopted by ARB, not by section 2449.3 itself. These restrictions are aimed at ensuring projects funded by the SOON program are cost effective. We do not anticipate that there will be a shortage of vehicles eligible for repowers under the SOON guidelines.

On March 27, 2008, the Board amended the Carl Moyer Program guidelines. The amended guidelines allow Carl Moyer funds to be used to help fund vehicle replacements, as well as repowers. This means that the SOON program could potentially fund vehicle replacements, as well as repowers.

The SOON program does apply Carl Moyer incentive funding requirements to ensure that the most cost effective projects are selected. Additionally, section 2449.3 does not require that only Carl Moyer monies be used to fund the SOON program. Any public funding program may be used to fund the SOON program; therefore, if other public funds are used, guidelines from those programs would be used, not the Carl Moyer guidelines.

1)h) SOON Limits Use of Vehicles Outside the Air District

- 1. Comment:** There will be times when the equipment owner has work outside of the air district providing the SOON funding and no work within this air district. The equipment owner will then be faced with renting or purchasing new equipment to perform this work even though he already owns equipment capable of performing the work which is sitting idle and not generating revenue. Contractors need to maintain the flexibility to dispatch equipment to locations where there is work for them to perform. The SOON program greatly restricts this flexibility. This represents an additional compliance cost to the equipment owner. This will result in nearly impossible compliance burden where equipment owners will have

equipment sitting idle in one air district while renting equipment to perform work in another air district only because the SOON restricts the operation of a significant portion of their fleet. (EUCA6)

2. **Comment:** The SOON program will require that the machine be used within the bounds of the air district 75 percent of the time for 7 years. The air district essentially conscripts the machinery from the owner, in that the owner must unwillingly enter an agreement restrict the ability to use the equipment when and where he chooses to. There will be times when the owner has work for the equipment out of the district but not in the district and will have to supplement his fleet to make up for the loss of productivity for this piece of equipment by renting. This is an additional, indirect cost of the program to the owner. (SHAWM3) (LEWISM3) (LEWISM4)
3. **Comment:** SOON contracts will require that equipment operate a vast majority of the time in the air district providing the funding, whether the equipment owner has work in the air district or not. There will be times when the equipment owner has work outside of the air district providing the SOON funding and no work within this air district. The equipment owner will then be faced with renting or purchasing new equipment to perform this work even though he already owns equipment capable of performing the work which is sitting idle and not generating revenue. Contractors need to maintain the flexibility to dispatch equipment to locations where there is work for them to perform. The SOON program greatly restricts this flexibility. (AGCA5)

Agency Response: The SOON program is focused on vehicles that operate primarily and consistently in a specific air district. Vehicles which have not operated in a specific air district more than any other district, for the three year period prior to the SOON contract, do not need to be reported to local air districts who opt in to the SOON program. The regulation also provides flexibility for fleets that may have operated consistently in an air district, but plan to move equipment to work in other air districts. Under section 2449.3(e)(8), a fleet owner may submit a statement to the air district that they intend to move a vehicle out of the area, or that it will not be used in the area on an annual basis in quantities sufficient to meet the air districts guidelines and thereby avoid participation in SOON.

We do recognize that in some cases, a fleet owner who has received SOON funding may unexpectedly acquire a contract in a different air district, or otherwise develop a need for a vehicle outside of the air district which could not be anticipated prior to participating in the SOON program. In such cases, the fleet owner may be responsible for repaying the air district who funded repowers for their vehicles; this would also allow the fleet owner to receive credit towards the statewide off-road regulation for the repower. The fleet owner would also have the option of renting vehicles to use outside of the air district, which we

recognize is a supplemental cost. However, as discussed in previous responses, after the contract period ends the fleet owner may recognize significant financial savings, and will not be penalized when using the repowered equipment outside of the air district.

1)i) Loss in Equity for SOON Funded Vehicles

- 1. Comment:** SOON puts an unfair economic hardship on contractors. Due to the Moyer contract requirements proposed for the SOON program, contractors can expect to lose equity in the SOON funded equipment which will reduce their ability to borrow and bond for their company's work outside the air district as opportunities arise in other parts of the state. (HUNTINGTON)
- 2. Comment:** Due to the Moyer contract requirements proposed for the SOON program, contractors can expect to lose equity in the SOON funded equipment which will reduce their ability to borrow and bond for their company needs. The requirements to operate within a specific district will further limit the contractor's ability to work outside the air district as opportunities arise in other parts of the state. (LEWISM3)
- 3. Comment:** Contractors are expected to contribute financially to the "over-compliance" requirements of the SOON. Participation in the SOON program will negatively impact equipment equity, borrowing ability, and bonding. The program requirements in the form of mandatory contract participation and dedicated equipment operational commitments are strong disincentives for virtually any contractor to participate. The Tier 0 and Tier 1 equipment that both the base regulation and the SOON program target is typically completely owned by the fleet owner with no direct debt attached to this equipment. The owner typically has a line of credit with a lender that is backed by the equity in this owned equipment. This line of credit is used to support new equipment purchases and to provide cash flow for day-to-day operations. In addition, the owner has a bonding capability based on a balance sheet that uses the equity in this owned equipment as a large part of the financial base of the company. The real equity base in the company is used by bonding companies to determine the amount of bonding available to the owner. The SOON program will require contractors to repower or replace equipment that they normally would not modify, even given the base regulation. The problem with this is that there is not a dollar-for-dollar value added to the equipment by going forward with these repower projects. The value of the equipment is based on the condition of the equipment and its engine(s), not on engine tier. On the day a SOON repower project is performed on the equipment, it is encumbered with a new liability in the amount of the district's contribution to the project. The equipment owner has also spent a considerable amount of his available cash (or access to credit), further weakening his balance sheet. Once this happens the finance company

issuing the line of credit will no longer attribute any equity to the SOON-repowered equipment to support the line of credit because the ownership of the machine is questionable given the district's position. The equipment owner's bonding company will follow the finance company's lead in terms of determining equity when calculating the contractor's ability to secure bonding. There will be a direct, significant reduction in the equipment owner's bonding capacity. Financing companies are dealing with the Moyer attachment to machines by simply not considering these encumbered machines as a part of the fleet for financing purposes. (EUCA6)

4. **Comment:** Even though the owner does not request or want to repower the machine and has no need to repower the machine to meet CARB Off Road Diesel regulation, this machine is chosen to be in the mandatory SCAQMD SOON program by the air district. The problem is, there is nowhere near dollar for dollar value added to the equipment by doing these repowers. The value of the machine is based on the condition of the machine and the condition of the engines, not their tier. The finance company that has the line of credit will no longer use any remaining equity in these machines to support the line of credit because the ownership of the machine is "clouded." Financing companies are dealing with the Moyer attachment to machines by simply not considering these encumbered machines as part of the fleet for financing purposes. The owner's bonding company will follow the finance company in terms of viewing the owner's equity when calculating the contractor's ability to bond. There will be a direct significant reduction in the owner's bonding capacity. This negative impact must be multiplied by the number of machines brought under the impact of the SOON program. The true impact could quickly have a 7 figure negative impact rippling through the company's balance sheet and bonding ability. (SHAWM3) (LEWISM3) (LEWISM4)

Agency Response: We disagree that the contracts between local air districts and fleet owners will have a significant negative impact on fleet owner's equity and bonding capacity. The Carl Moyer program, which in its first seven years of operation provided \$170 million to clean up approximately 7,500 engines throughout California, requires a similar contract between vehicle owners and the state. Vehicle owners must agree to a minimum three year contract period to ensure that emissions reductions are achieved, and that the emissions reductions are surplus to the regulation. During the last three years, off-road projects have received an increasing portion of the Carl Moyer funding. Fleet owners in the construction industry have been involved with revising the Carl Moyer program guidelines and the issue of equipment equity and impacts on bonding has not been raised as a problem, according to ARB Carl Moyer staff.

The exception to this occurs when the Carl Moyer program purchases new, low emissions vehicles for fleet owners, in which case the state is named the lien

holder for the duration of the contract period. However, this does not lower the equity of the fleet owner, and substantially increases their equity upon the expiration of the contract period.

If the situations arises that financial institutions do lower their estimation of a fleet's equity based on contracts with a local air district, the effect will be limited to the contract period. We recognize this would place an additional burden on fleet owners for the contract period, but as discussed in the response in section III-A-3)e)v) of this FSOR, large fleets are the least likely to apply for the full amount of bonding for which they are eligible, and would sustain the least impact due to a temporary loss of equity for a portion of their fleet.

For additional discussions on how the off-road regulation will affect a fleet's financial situation, please see the responses in section III-A-3)e) of this FSOR.

The limitations on the use of vehicles participating in the SOON program is discussed in the response immediately prior to this one in this chapter.

1)j) Make SOON Mandatory

- 1. Comment:** Under the latest revision of the regulation, air districts opting in to the SOON program can choose whether the program will be voluntary or mandatory after April 2, 2009. However, the SOON program, as presented, calls for affected fleets to meet more stringent SOON NOx fleet average targets and apply for funding. There would be no requirements on fleets if projects are not funded. The provision does not provide assurance that the committed NOx emission reductions can be fully achieved and may jeopardize federal approval of the SOON Program into the SIP. As such, the SOON language should be revised to reflect a mandatory program. In summary, the AQMD staff believes that with the above revision to require a mandatory program, the SOON program can move forward in an effective manner to ensure that the commitments to additional NOx emission reductions in the 2007 California SIP are met. (SCAQMD3)

Agency Response: Local air districts may opt to make participation in the SOON program mandatory in their air district, beginning in 2009 for San Joaquin and South Coast, and 2010 in all other California air districts. We do not agree that all air districts which opt in to SOON need to make participation by fleets mandatory. Many air districts do not have the funding available to manage the SOON program, and others may have funding but do not need to make SOON a mandatory program in order to meet air quality standards. Additionally, we do not believe that ARB has the authority to make the SOON program mandatory before April of 2009. After the regulation is approved by our Office of Administrative Law (OAL), ARB will be requesting an authorization from U.S. EPA for the performance requirements and accompanying enforcement provisions of the off-road regulation. It is unlikely this waiver will be granted in

2008, and therefore, a mandatory SOON program in 2008 would be unenforceable by ARB staff.

Meeting committed NOx emissions reductions will depend on the funding provided by local air districts and the ability of fleet owners and air districts to select and fund cost effective projects. We believe the SOON program will be credible as structured and will receive federal approval into the SIP. It should be noted the voluntary portion of the SOON program is comparable to the current Carl Moyer program, which has achieved significant emissions reductions and which has been included in the SIP.

1)k) SOON Presented as Voluntary

- 1. Comment:** At the July 26, 2007, Board meeting, SOON was presented to the Board as a voluntary program to gain additional reduction in NOx emissions from fleets regulated under the in-use off-road diesel vehicle regulation, and allows local air districts to opt in or opt out. Fleet owners do not have the option to opt in or opt out. The major issue presented at the board meeting was the fact that air districts that opt in to SOON would fund 100% of the surplus cost of the program. (NWS3) (LEWISM3)
- 2. Comment:** The SOON program was originally presented as a voluntary, fully funded effort to help two local air districts, South Coast and San Joaquin, achieve additional NOx reductions that they suggest are needed to achieve compliance with the federal PM2.5 standard in 2014. (EUCAG6)

Agency Response: We disagree that the SOON program was ever presented by ARB, or at a public hearing held by ARB, as a voluntary, fully funded program. The presentation of SOON by South Coast representatives in July, 2007 included testimony that fleets would be required to fund a portion of actions required by SOON. This is discussed in the response in section III-B-9(b) this FSOR.

1)l) SOON Program Timing

- 1. Comment:** Industry stakeholders had little, if any, opportunity to fully consider the potential impacts of the SOON program prior to its consideration by your Board. This lack of opportunity for stakeholder input, as well as actions taken by the Board at the July, 2007 hearing have made the SOON program unworkable and have, as a result, made the already problematic Off-Road Diesel Regulation even more difficult to comply with. The SOON program is projected to continue well beyond 2014 whether or not South Coast and San Joaquin achieve compliance with the federal PM2.5 standard. Setting the benchmark for determining contractor SOON eligibility at January 1, 2008 gave contractors very little time to plan and places too large a period of time between the eligibility date and the first compliance date. Contractors did not have sufficient time to alter their fleets to avoid SOON participation if that was their

desire. Also, SOON does not recognize positive, aggressive fleet improvement steps contractors may take between 2008 and the first SOON compliance dates in 2011 and 2014. For example, a fleet may have been SOON-eligible on January 1, 2008 but is able to take actions to achieve an all Tier-2 fleet by 2014. This would leave the fleet with zero percent Tier 0 and Tier 1 vehicles, comfortably in compliance with the NOx fleet average targets in the base regulation in 2011 and 2014 but still not in compliance with the SOON fleet average targets in 2014. This fleet will have expended tremendous resources to comply with the base regulation only to be faced with additional requirements in local air districts who still want them to do more, and at a greater cost of compliance. (EUC6)

Agency Response: Although the Board directed that the SOON program be included in the off-road regulation at the July 26, 2007, Board meeting, the initial notice issued by the Board for consideration of the regulation informed interested stakeholders that the Board would be considering NOx performance standards for in-use off-road vehicles that operate within the State and that the Board may consider more stringent requirements to achieve SIP mandated deadlines as increased flexibility for regulated stakeholders. Stakeholders appeared at the hearing and were prepared to testify on the program. After the hearing, but before the February 5, 2008 publication of the second 15-Day Notice, which included text of the SOON program, ARB staff held numerous meetings with interested fleets and participated in the South Coast district SOON workgroup.

The SOON program is intended in part to aid local air districts in meeting their 2014 deadline for compliance with the federal air quality standards for PM, but is also expected to help meet future federal standards for 8-hour ozone attainment.

We also recognize that some fleets that are required to participate in the SOON program based on the composition of their fleets in 2008 will make improvements to their fleets by the SOON compliance dates. As mentioned above, the SOON program is focused on the most cost effective projects. A fleet which has turned over all their Tier 0 and Tier 1 equipment will likely not be selected to participate in the program unless all Tier 0 and Tier 1 equipment in the air district has been repowered or replaced.

If due to the SOON program, and the inability to receive credit towards the statewide off-road regulation for vehicle emissions reduction funded through SOON, a fleet is required to turn over a vehicle that is Tier 2 or higher to meet the statewide off-road regulation requirements, the fleet owner may apply for an extension from the BACT requirements. This provision is described in section 2449.3(e)(2).

1)m) SOON Effect on Competitiveness

- 1. Comment:** An additional consideration is one of competitiveness. SOON-obligated companies will often be faced with competing against fleets that are just under 20,000 horsepower or just under 40 percent Tier 0 and Tier 1 for work. These contractors who just barely miss the SOON-obligation benchmarks will have a competitive advantage over those that are forced to bear the additional costs and equipment operation restrictions of the SOON program. (EUCA6)
- 2. Comment:** Because the owner is a large fleet owner, the severity of the impact of the SOON program puts him at a distinct economic disadvantage when competing with other fleet owner's that are not compelled to be in this program including but not limited to small and medium fleet owners. Other owners with exactly the same machines are allowed to do things with their equipment that this Owner is not allowed to do. (SHAWM3) (LEWISM3) (LEWISM4)

Agency Response: As discussed in the response in section III-C-1)b) of this FSOR, we recognize that the SOON program will increase costs for affected fleets during the initial period, but believe these costs will be offset after the contract period ends. This includes the effect of competition between businesses. The SOON program will likely decrease the long term cost of compliance with the statewide off-road regulation for participating fleets, which will increase their competitiveness in the marketplace over the long term.

1)n) Only Consider Equipment that Can be Repowered

- 1. Comment:** No distinction is made between equipment that can be repowered and equipment that can only be replaced. Because the districts view SOON as primarily a repower program, only equipment that can be repowered should be considered with respect to the 40 percent eligibility criteria. (EUCA6)

Agency Response: As discussed in the response in section III-C-1)g) of this FSOR, the Carl Moyer program was revised on March 27, 2008, and now allows funding for vehicle replacements. This affects the SOON program as Carl Moyer funding is being used to fund the SOON program.

However, air districts participating in the SOON program are not specifically required to use Carl Moyer incentive monies to fund the SOON program. If other funding is available to a district (including funds that may have no incremental cost requirements), those monies could potentially be used to fully fund SOON projects.

Additionally, the requirement that a fleet must consist of 40 percent or more Tier 0 or Tier 1 vehicles to face mandatory participation in the SOON program helps

identify the oldest fleets with the highest emissions, and we do not believe that only equipment which can currently be repowered should be considered in determining the portion of a fleet's horsepower which is below Tier 2.

1)o) Illegally Forces Signing of a Contract

- 1. Comment:** The SOON program is flawed in that it mandates that vehicles owners unwillingly sign a contract with the air district. It does not directly state that the owner of a piece of equipment is compelled to sign a binding contract with the air district. Rather, it states that it is mandatory for the owner to an application for funding. It then states that the owner shall complete any projects selected through SOON. I believe it is implied that, through the SOON program, the owner is compelled to sign these contracts and that if he refuses, he will be subject to action by either the air district or the state. Upon review of the SCAQMD Carl Moyer contract, I am convinced I could never negotiate this contract to what I would consider reasonable terms. If this is the case, then by what authority am I compelled by the air district to unwillingly sign the contract? Some issues that arise:

Review by counsel: The language in the contract states that I have had the contract reviewed by counsel. My attorney will recommend that I not execute this contract. How is this to be dealt with?

Indemnity Language: There is very strong indemnity language in favor of the air district. If I am being compelled to execute this contract, why would I want to provide any indemnity to this agency or its employees or consultants? I would require that I receive complete indemnity in my favor from the air district. No public agency will provide my company with complete indemnity for machinery I own.

Insurance: The insurance requirements of the contract are well in excess of any insurance I may consider having on the equipment. (SHAWM3) (LEWISM3) (LEWISM4) (EUCA6)

- 2. Comment:** ARB lacks the authority to require fleets to consent to the terms of solicitations dictated by local air districts. By its terms, the SOON program purports to allow local air districts to set the terms of a solicitation, and mandate that fleets selected for funding agree to those terms. There is no legal basis, and ARB cites none, that could allow ARB or local air districts to unilaterally set the terms of a contractual agreement, and mandate that a private party accept state funds and agree to the contract terms. Just as one party cannot unilaterally change the terms of a contract, neither can a government entity mandate that a private party enter into a contract. (Talk AM. Inc. v. Douglas, 2008 US Lexis 2299, "Indeed a party cannot unilaterally change the terms of a contract, it must obtain the other party's consent before doing so.") At a minimum, such a requirement is problematic under the Due Process principles and the Impairment of Contracts clauses of the United States and California constitution. (ATA3)

- 3. Comment:** The SOON program requires that equipment owners enter into contracts with air districts whether they want to or not and regardless of whether they are capable of meeting their financial obligations as stated in the contract. If an equipment owner is unwilling to sign a contract he is potentially subject to enforcement action by either CARB or a local air district. The operational conditions in the contracts are also cumbersome and add cost to compliance. SOON contracts will require that equipment operate a vast majority of the time in the air district providing the funding, whether the equipment owner has work in that air district or not. EUCA is not aware of any authority that CARB or any local air district has to force an equipment owner to involuntarily sign a contract they knowingly are unable to comply with. (EUCA6)
- 4. Comment:** The SOON program requires contractors to sign long term contracts “under duress”. The SOON program anticipates that each contractor whose equipment is selected for SOON funding will have the resources available to fund their share of the compliance costs as well as commit to a seven year contract period and all the onerous terms that are included in the most recent Moyer contracts. It also assumed that a contractor can be forced to sign the Moyer contract when his accountant and attorney bother him not to. Not only is this unrealistic, but contractors are already beginning to return voluntary Moyer contracts to optimize their fleet flexibility in anticipation of the off-road rule. Nevertheless the SOON program expects contractors to comply with the program even though they cannot sign the SOON funding contract. That leaves contractors only the option of selling the piece of equipment in order to comply. That option does not solve the districts problem of needing a verifiable emissions reduction contract to satisfy EPA’s requirement. The “forced” over-compliance anticipated by the SOON program will not work, and as a result the desired emissions reductions will never be achieved.
(LEWISM3)

Agency Response: We disagree that the SOON program forces fleet owners to sign a contract. ARB has the legal authority to regulate emissions from diesel vehicles and establish emission standards (H&SC §§ 43013(b) and (h)). The Board adopted the fleet average targets in the SOON program pursuant to this authority. Fleets that meet the emission targets in section 2449.3 are not required to report to local air districts that opt in to the SOON program, apply for grant funds, or enter into a contract with the local air districts.

A Fleet that has vehicles that operate within an opt-in air district and has a total statewide fleet with a total maximum power of 20,000 hp or greater and 40 percent or more Tier 0 and Tier1 vehicles, is required section 2449.3 to file reports regarding the statewide fleet and those vehicles that operate within the district, calculate a NOx index for those vehicles that operate in the district, and

determine if the district-based fleet meets the NOx targets. If it does exceed the NOx targets, the fleet effectively has several options. It may apply for SOON funding, which would entail, if granted, that it enter into a contract with the opt-in district pursuant to the fleet funding guidelines adopted by the air district and approved by ARB. Alternatively, it may choose to meet the SOON targets using its own funds, move vehicles permanently out of the air district, or establish that vehicles would be moved out of the air district during the period of SOON funding and would not operate sufficient hours within the district to qualify for SOON funding. As such, with the various options available, the SOON program does not “force” fleets to sign a contract for funding.

If a fleet owner decides not sign the contract, it will not receive air district funding and will have to take one of the aforementioned alternative steps to comply with the SOON targets.

Section 2449.3 does not set forth the terms of the local air district SOON program funding contracts. That will be developed and considered by the local air districts, as part of their funding guidelines, which fleets will be welcome and encouraged to comment upon.

1)p) Impact of SOON Misrepresented

- 1. Comment:** The real impact to real businesses is not accurately represented by the staff's analysis. If the SOON program is as good as is portrayed by staff, contractors and owners would be lined up to take advantage of it, but they are not. I take exception to the staff's oversimplification of the real impact of this regulation on business. The economic analysis provided by the staff relative to the "cost" to the owner of a piece of equipment could be accurate when the piece of equipment is taken out of context of fleet ownership, or, in other words "in an ideal world". The conclusion of the staff is that there might be a very minor cost to the owner on the front end but it will be more than made up on the back end and everything will be O.K. In the real world, things do not work this way. (SHAWM3) (LEWISM3) (LEWISM4)

Agency Response: We disagree. Following the board hearings in July, 2007, the staff worked closely with construction industry representatives to discern the most practical and cost efficient methods to implement the SOON program. We recognize that fleets will have varying costs to participate in the SOON program based on individual circumstance, but every effort was made to limit mandatory participation to fleets which could absorb or pass on costs for the duration of the SOON contract period. The staff will continue to work with fleet owners affected by the SOON program and air districts that opt into SOON, and respond to unexpected conditions as they may arise, in order to minimize the burden to affected fleets.

We also recognize that fleet owners may not wish to participate in the SOON program for a number of reasons, including the added requirements and initial cost that SOON entails. However, as discussed in the response in section III-C-1)o), a fleet has the option of meeting the SOON NOx fleet targets or taking other steps to achieve compliance, which would exempt them from participating in the program.

1)q) Base SOON Participation on Reporting Data from Statewide Regulation

1. **Comment:** Fleet owners are required to research all the air districts that have opted into SOON. If a district chooses to make the SOON program mandatory, fleet owners are required to apply for SOON funding on each unit with a Tier 0 or Tier 1 engine. After the fleet owners file the initial reports to CARB on April 1, 2009, the local air district could review the initial report and make the decision as to which fleets should be in the SOON program. At that point, the local air district would contact the fleet owners and request the filing of the application for SOON funding. NWSC believes that placing the requirement on all large fleets to submit applications on each unit will generate additional red tape and administrative cost to the fleet owners. Fleet owners are required to develop a subset fleet, and calculate the NOx index for each air district each year to determine the NOx target rate for each vehicle to meet requirements. NWSC's recommendation is for CARB staff to develop regulatory language to require the local air district to review the initial reports and the annual reports to determine which fleets and which vehicles will generate the greatest reduction in NOx. (NWS3)

Agency Response: We do not believe that this suggestion would be viable. In order to lessen the reporting requirements in section 2449, the regulation does not require fleet owners to submit the hours of use for each vehicle that must be reported to ARB under the statewide off-road regulation. Without this information, local air districts would not be able to determine which vehicles could be repowered to achieve a cost effective surplus emission reduction. As discussed in the response in section III-C-1)b) in this FSOR, we recognize that planning and reporting compliance with the SOON program will present an additional cost to fleets, but anticipate that in most cases, fleets will recognize an overall economic benefit by participating, once the SOON contract period expires.

Additionally, a fleet owner is not necessarily required to submit a SOON application for every Tier 0 and Tier 1 in the fleet. A fleet would only need to submit applications for enough vehicles so that the subset fleet meets the SOON NOx targets.

We finally wish to note that local air districts do review projects proposed by participating fleets, and are required to work with fleet owners to determine the most cost effective projects to pursue.

1)r) SOON Not Fully Funded

- 1. Comment:** During the Board meeting, SCAQMD presented SOON stating that 100 percent of the funding would be supplied by the air districts that opt in to the program. The regulatory language has been changed to state that the SOON funding guidelines will be consistent with the applicable Carl Moyer program. The Carl Moyer guidelines require that part of the project be funded by the fleet owner. The regulation has already placed a large capital investment on fleet owners to comply with this regulation. Now the SOON program will place an additional capital investment on fleet owners who may not have the funds for the original compliance cost to the regulation. NWSC's recommendation is for CARB staff to develop regulatory language requiring the SOON program to be funded 100 percent by the air district. (NWS3)
- 2. Comment:** The SOON language states that local air district's guidelines "must include...a description of any requirements on fleets that received SOON funding to pay a part of the SOON project cost." AGC requests that the SOON program must fully fund all emissions reduction strategies – including diesel retrofit – where such actions decrease a participating fleet's overall NOx emissions beyond what is required by the off-road regulation. Most contractors working in California will find it challenging, if not impossible, to finance the cost of complying with the baseline regulation. It follows that it will be economically infeasible for many companies to also absorb fees under the SOON program (i.e. matching funds, cost of DPF installations, etc). By allowing the district to make the program mandatory, eligible fleets will be forced to apply for funds even when they know they do not have the matching dollars needed to participate. For example, Carl Moyer funds, which will be a revenue stream for some districts participating in SOON, may only be used to pay the portion of the repower cost beyond the assumed cost of a normal engine rebuild. ARB assumes that rebuild costs are about equal to 15 percent of the total cost of the repower. However, under the 2008 Moyer Guideline Revisions the minimum co-fund is proposed to be 15 percent of the full Tier 3 repower costs. (AGCA5)

Agency Response: We disagree that the SOON Program was initially presented as a fully funded program. Also, it is important to note that the co-funding requirements that are part of the Carl Moyer program are intended to ensure that the funds provided do not pay for normal business costs. For example, the 15 percent co-fund for repowers is intended to reflect the fact that the engines being replaced would have been repowered anyway during the project's contract period. However, if a project applicant can demonstrate that a

rebuild would not have been done anyway during that period, the district will not require the fleet to pay the 15 percent co-fund. Each air district opting into the SOON program must include this language in their SOON guidelines before approval of the guidelines is given by ARB. For further discussion of this issue, please see the response in section III-B-9)b) of this FSOR.

1)s) Partial Credit for SOON Projects Under Statewide Regulation

1. **Comment:** The regulatory language states “During the contract period, vehicles equipped with NOx retrofits, repowered with new engines, or that have been replaced with the SOON program funding, cannot use this lower emission rate to calculate NOx and PM rates. These vehicles must be reflected as if the actions taken under the SOON program did not occur.” NWSC’s recommendation is for CARB staff to develop regulatory language to allow some credit for NOx and PM because the fleet owners are required by the regulations to fund some part of the SOON project cost. (NWS3)

Agency Response: We disagree that emissions reductions actions funded in part by the SOON program should provide credit toward the regulation prior to the end of the contract period. The goal of the SOON program is to provide emissions reductions which are surplus to those achieved by the base statewide regulation. Providing partial credit towards the base regulation for projects initiated by the SOON program would undermine this objective, and would not ensure that all emissions reductions achieved are surplus during the contract period. Additionally, after the contract period ends, fleet owners will receive full credit for all emissions reductions funded by the SOON program. As discussed in the response to 9)b) of this FSOR, we anticipate that although SOON will present fleet owners with additional costs, such as partially funding surplus emissions reductions projects, most fleets will recognize an overall economic benefit by participating.

1)t) Hold SOON Workshops

1. **Comment:** NWSC is concerned with the requirement on applying for SOON funding and completing the projects in a timely manner. NWSC is currently involved in a repowering program with its fleet. NWSC is experiencing four to six months for completion of one repowering project. These projects require planning, engineering, and funding before the project starts. NWSC is experiencing thirteen to eighteen weeks delivery on engines at this time. NWSC is concerned with the requirement of getting the SOON funds from the air district, and being required to have the project completed on a short time schedule. NWSC’s recommendation is for CARB staff to conduct several workshops on the SOON program to achieve consensus on the solutions. (NWS3)

Agency Response: We recognize that projects funded through SOON may experience delays based on conditions outside the control of the vehicle owner, such as manufacturer delays or delays due to installation. Although this issue will be primarily handled by the local air district providing the funding, in our review of the district's SOON program guidelines, ARB staff will encourage air districts to develop fair and practical procedures to handle delays in SOON funded projects, and hold public workshops for affected fleet owners to discuss these issues, such as the current SOON workshops initiated by the South Coast Air Quality Management District.

In addition, we plan to discuss the SOON program as part of staff's presentation at the statewide implementation workshops on the in-use off-road diesel vehicle regulation, which we plan to hold during spring and summer 2008 across the state.

1)u) Vehicles Moved to Different District

1. **Comment:** If a fleet owner receives SOON funding from one air district, the contract will require the equipment to remain in that air district for five years. If the equipment is moved from one air district to another, the fleet owner will be required to refund that part of the contract not completed. NWSC's recommendation is for CARB staff to develop regulatory language requiring for the air district receiving the SOON equipment to refund the balance of the contract to the original air district. The air districts may make the statement that they do not have the funds in their account to make the reimbursement. The fleet owners may have the same problem at the time of the move. Fleet owners have to get work where they can find it. (NWS3)

Agency Response: We do not believe this is a viable addition to the SOON program and believe this suggestion is not practical for a number of reasons. It would be difficult for SOON air districts to set aside funding for this purpose because they would not know ahead of time which vehicles might enter their district. Finally, many air districts will not opt into the SOON program, and would potentially not have any available funds to pay the remaining SOON balance on vehicles that enter their district.

As discussed in the response in section III-C-1)h) in this FSOR, the SOON program is aimed at vehicles operating primarily and consistently in a single air district, and fleet owners are not required to apply for SOON funding for vehicles they intend to move out of the area.

1)v) SOON Only for Vehicles That Will be Funded

1. **Comment:** ARA recommends that the SOON Applicability Criteria in section 2449.3(b)(2) be modified to reflect the intent to capture large Tier 0 equipment that will remain in the fleet for many years to come and where

economic repowering is feasible. Furthermore, ARB and the districts should provide guidance on the type of projects that might be considered on a cost effectiveness basis and this should be built into the applicability requirements to insure that the fleets that would never receive SOON money do not have to go through all the reporting, planning and application efforts required by this complex program. What size, operating hours, duty factors, and differential costs would justify a SOON project? (ARA4)

2. **Comment:** Neither air districts nor fleets should have to prepare or process unnecessary paperwork for SOON applications for equipment that could not qualify for SOON funding. The application process will require large and financial commitments for relatively little funding. Most relevantly from a paperwork-reduction perspective, however, the time and efforts spent by many fleets will be wasted because those fleets will have equipment that not only will not but cannot be funded in the ended (because of equipment types, cost-effectiveness criteria, etc). Even without amending the SOON program, ARB can and should commit to work with air districts and industry to prepare SOON guidelines, criteria, and forms in ways that minimize the submission of unnecessary paperwork, such as information on equipment that cannot qualify for SOON funding. (AGCA5)
3. **Comment:** The requirements proposed by the air districts that require repowers under the SOON program to be from a Tier 0 to a Tier 3 engine significantly reduces the pool of equipment. Since 2000, the construction industry has repowered nearly 2,500 pieces of equipment under the Moyer program. Because Tier 3 repowers were not introduced until 2006, only about 5 percent of the repowers were done with a Tier 3 engine. That equipment falls into six types; wheel loaders, scrapers, wheel dozers/compactors, excavators, loaders, track type tractors and motor graders. All of this equipment is in excess of 200 horsepower, and manufactured before 1988. It is the oldest equipment in the fleet. We believe that fewer than 10,000 pieces of this equipment exist in the state today, perhaps substantially fewer, and the pool is shrinking rapidly due to age and frame life. We would recommend that the SOON program be modified with a replacement or scrappage program aimed at just the six specific pieces of equipment that can meet the repower requirements. SOON applies to equipment that cannot qualify for the Moyer program. Many contractors will be in the SOON program by reason of their 20,000 horsepower fleet and 40percent Tier 0 and Tier 1 machines, but that does not mean that they will own equipment that can be repowered under the Moyer requirements. It will generate an enormous cost to develop the compliance plans and paperwork for contractors to submit equipment funding applications to demonstrate SOON compliance yet never be eligible for funding. Furthermore, a fleet that is composed of all Tier 2

engines will not meet the SOON targets in 2014. There needs to be a mechanism by which fleets are removed from the SOON eligibility when the target equipment is not available. (LEWISM3)

Agency Response: We do commit to work with air districts that opt into SOON and affected fleets to attempt to minimize the submission of unnecessary paperwork required under the SOON program. However, we disagree that the regulatory language should be changed to apply the SOON program to a smaller subset of off-road diesel vehicles. The requirements by specific local air districts that SOON must only fund Tier 3 repowers do not necessarily apply to other air districts. Some air districts may choose to fund repowers to Tier 2. The Carl Moyer restrictions are also limited to projects funded under the Carl Moyer program guidelines; air districts may choose to use other sources of public funding. We recognize that some fleets may be required to submit SOON compliance plans for projects which will not receive funding in their air district, but we believe this is necessary to allow districts a pool of projects to choose from so they may select the most cost-effective projects to fund. Additionally, the availability of Tier 3 repowers for specific vehicle types could change at any time, and if a specific list of which vehicles can accept repowers were written into the regulatory language (as suggested in the LEWISM3 comment), this list would become out of date and inaccurate over time.

Local air districts in their SOON guidelines may provide reporting procedures which further limit the reporting requirement to specific vehicle types, years or tiers, but we do not believe the regulatory language is the appropriate place to describe these reporting procedures.

1)w) Cost of Application for Fleets Not Receiving Funds

- 1. Comment:** ARB staff evidently failed to consider the substantial costs imposed on those fleets that are required to apply for SOON funds, but ultimately do not receive them. Those costs achieve no air emission reductions, and must be considered by ARB in evaluating the cost effectiveness of the regulation. Moreover, the SOON appears to place no limitation on the number of fleets forced to apply, regardless of the amount of funds actually made available by a District for a particular solicitation. There is no reason for ARB to impose such a magnitude of administrative process that may have little or no relationship to any potential to achieve emission reductions. In any event, in light of ARB's determination that fleets who receive SOON funding will realize an economic benefit, there is no reason to force fleets to apply for funds. The same objectives can be achieved through a voluntary program that provides an "incentive" and not a mandate, consistent with the Carl Moyer Program legislation. (ATA3)
- 2. Comment:** Neither air districts nor fleets should have to prepare or process unnecessary paperwork for SOON applications for equipment that could not qualify for SOON funding. The application process will require

large time and financial commitments for relatively little funding. Most relevantly from paperwork-reduction perspective, however, the time and efforts spent by many fleets will be wasted because those fleets will have equipment that not only will not but cannot be funded in the end. Even without amending the SOON program, ARB can and should commit to work with air districts and industry to prepare SOON guidelines, criteria and forms in ways that minimize that submission of unnecessary paperwork, such as information on equipment that cannot qualify for SOON funding. (AGCA5)

Agency Response: We will work with air districts and industry to try to minimize the submission of unnecessary paperwork for SOON. We acknowledge that some fleets may apply to the SOON program but not receive funding; however, the projects not accepted for SOON funding one year may be funded in later years. Additionally, a portion of the information needed by the districts (such as vehicle information) must be submitted to ARB by April 1, 2009 to meet the initial large fleet reporting requirements for the off-road regulation. Therefore, this information will already be collected by the fleet, and will not represent an additional burden. Although some of the fleet information collected for the off-road regulation will be needed by the districts, other information, such as the usage of the vehicles, must also be submitted by the fleets to the air districts. We acknowledge this may be an additional reporting requirement; however, it is necessary information needed by the air districts to determine the cost-effectiveness of eligible vehicles.

Also, if an air district feels they can achieve emissions reductions through a voluntary SOON program, they may do so; it is left up to each air district to decide whether or not they want a mandatory SOON program.

Finally, we would like to note that many large fleets (with potentially cost-effective repower projects) are currently in-eligible for Carl Moyer money due to the proximity of the first compliance dates of the off-road regulation. The SOON program will allow larger fleets, that are currently ineligible for Carl Moyer, access to incentive funds for achieving early emissions reductions.

1)x) Require SOON Only for Fleets on BACT Path

- Comment:** SOON should apply only to fleets satisfying the statewide rule through BACT. (ARA4)

Agency Response: We disagree. Limiting the applicability of SOON only to fleets satisfying the BACT provisions in the statewide regulation would decrease the total number of eligible fleets that participate in the program. Additionally, sections 2449.1 and 2449.2 allow a fleet to alternate from complying with the fleet targets in one year and complying with the BACT requirements the next; therefore, we believe it would be difficult to determine which fleets would be

eligible for SOON funding based on what compliance path for the statewide regulation they take each year.

1)y) Clarify SOON Language

- 1. Comment:** Businesses seem to have to complete the SOON exercise to determine if they fall under the applicability requirement. What records do they need to keep and for how long must they keep such records? If a company decides in good conscience that the program does not apply but the district in a mandate environment has the opposite finding, how is this dispute settled. The applicability requirements are biased on tier only. It is not indicated whether this criterion is based upon horsepower or count-weighted percentage of equipment. We believe that criterion should be based upon fleet horsepower weighting to favor fleets with larger engines. (ARA4)

Agency Response: The recordkeeping requirements are outlined in section 2449(g) of the regulation; section 2449.3 does not require any additional recordkeeping.

Additionally, ARB is in charge of enforcement of the SOON program. Therefore, ARB staff will settle any disputes (if any should arise) between the air districts and fleets participating in the SOON program.

The 40 percent Tier 0 and Tier 1 applicability criterion in the SOON program is based on vehicle count. Using vehicle count will bring more fleets into the SOON program, and will not limit a fleet's access to SOON money based on the types or horsepower of the vehicles in their fleet.

1)z) Applicability of SOON to Rental Companies

- 1. Comment:** A consequence of the SOON program is that rental companies with large fleets of small engines might be mandated to participate under SOON. This is an unnecessary burden imposed by the SOON program because it will never provide any NOx benefits. The reason for this consequence is that rental fleets are generally composed of smaller horsepower engines. If it is assumed that the particular rental fleet is composed of 99 and fewer horsepower engines, that problem is immediately obvious. The introduction of Tier 2 engines under 100 horsepower did not occur until January 1, 2004. Based upon a January 1, 2008 date, the latest model engine in the fleet will probably be 2007. Thus, for a typical fleet with 5-year average age and uniform distribution of equipment model years, on January 1, 2008, 60 percent of the fleet is still Tier 1 and Tier 0. Yet, due to normal turnover, this fleet will always meet the averaging requirements when the rule comes into effect because the fleet with 11 model years would have no Tier 1 or Tier 0 equipment in its fleet. If there is no assurance that a particular piece of equipment will be

present in the fleet in 2014 because of fleet turnover, why require a fleet to participate in the exercise. Further, in survey data we provided ARB, we documented that the average usage of rental equipment is approximately 500 hours per year. Such small equipment cannot be repowered. The business would probably never qualify SOON finding because of the low usage and the business's plan would be to replace equipment anyway on its normal schedule without State or District money. (ARA4)

2. **Comment:** The SOON rule applies to very large companies, not smaller businesses. These larger company fleets may move around the state and between districts. Rental companies have no information on where particular equipment was actually operated and how long during the preceding three years. Prior to this regulation, there was no legal requirement to track and report use by AQMD. It is probably impossible for rental companies to determine if any of its equipment operated the majority of time in a certain district. Participating in SOON would be inconsistent with the rental company's business model. Rental equipment can stay in a district or be moved. It is a burden on rental business to limit operation of any equipment falling under SOON to the affected district. While there is no specific section regarding enforcement of this part, we assume that there is some mechanism present in this part of the rule. Suppose that a rental company has a piece of equipment paid for with SOON funds. Further, suppose that the renter moves this unit out of the district so that the required percentage of operating hours is not met. Who is responsible? (ARA4)

Agency Response: We acknowledge some rental fleets may be required to participate in SOON. However, as discussed in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008, we do not believe SOON will impose a significant burden on participating fleets.

As discussed in the response in section III-C-1g) of this FSOR, the Carl Moyer program was revised on March 27, 2008, to allow funding for vehicle replacements. Since we expect the SOON program to largely be funded with Carl Moyer Program funds, this means that SOON can now pay for vehicle replacements in some cases. Therefore, even though a vehicle cannot be repowered, it may still be eligible for SOON.

We acknowledge that some fleets have smaller vehicles with naturally high turnover rates, and that those vehicles will most likely, not be cost-effective candidates for the SOON program. Additionally, if a fleet has a high turnover rate, and is meeting the SOON fleet targets in the applicable years, they will not be required to apply for SOON funding. However, as stated, some rental fleets will be subject to the SOON program. Many rental fleets contain long lived high

horsepower vehicles, which may be cost-effective to repower under the SOON program

If a fleet does not have vehicles that have operated within a SOON district in the three previous years prior to the solicitation year, or if the vehicles within the fleet will not be operating sufficient hours within the district during the contract period, those vehicles may not be eligible for SOON funding.

If a rental fleet participates in the SOON program, they would be held responsible for fulfilling the contractual requirements of SOON program; they are responsible for keeping their SOON vehicles within the SOON district as required by the SOON project contract. Therefore, it is suggested that the rental company address the SOON vehicle requirements in relevant rental contract agreements with its renters, providing notice and identifying which party has responsibility and liability for keeping the vehicle within the SOON district as required by a SOON funding contract.

Please see also the response in section III-C-1)h) of this FSOR for a discussion of SOON restricting vehicles to operating within a district.

1)aa) Cost Effectiveness of SOON

1. **Comment:** SOON requires Districts to prioritize projects on “the optimum NOx cost effectiveness”. What is the definition of “optimum effectiveness”? A definition of cost effectiveness and a methodology for computing it should be included or referenced in this rule. It appears under (f)(2) that projects do not need to be cost effective to be SOON-worthy. Section (f)(2) suggests that districts may establish cost effectiveness limitations. Public money should be spent on cost effective projects. If a project is not cost effective, the district should spend its money elsewhere to buy NOx. The off-road rule is based on a cost effectiveness calculation. The same cut point and methodology needs to be followed under SOON to be consistent. (ARA4)

Agency Response: The cost-effectiveness criteria is set by the SOON district guidelines, and are based on the cost-effectiveness criteria outlined by the funding sources used for the SOON program. For example, any district using Carl Moyer incentive monies to fund the SOON program must fund projects based on the Carl Moyer cost-effectiveness guidelines. ARB will review SOON district guidelines for fairness, reasonableness, and consistency with other districts.

1)bb) Change Cost-Effectiveness Thresholds

1. **Comment:** Some grant funding opportunities exist for off-road vehicles in the case of early compliance and for surplus compliance under the SOON program. We are not aware of any grant funding opportunities that exist

for compliance. Currently, the Carl Moyer Program is identified as the source of funding for the SOON program and early compliance with the off-road regulation. Therefore, the proposed 2008 Carl Moyer Guidelines would apply to these types of projects. For off-road equipment replacement projects, the general requirements of the proposed 2008 Guidelines will require the scrapping of off-road equipment replaced by new equipment purchased using Moyer funds. The 2008 Guidelines indicate that up to 80 percent of equipment replacement costs can be funded, up to the cost-effectiveness (CE) limit, for early compliance, in the event that the equipment cannot be repowered. In sample calculations, using 2008 proposed Moyer Guidelines and the CE threshold of \$16,000, the actual coverage is much lower than 80 percent, and closer to half that amount. If the more competitive CE thresholds (i.e., \$5,000 CE) are used locally, local awards are expected to be much less, around 15 percent of the off-road equipment replacement costs. For public entities with less mileage on their equipment, these ranges are lower and closer to 10 percent. The lower end of this award range, in many cases, does not cover the lost salvage value of the scrapped equipment, thereby creating a disincentive to apply for equipment replacements. The City has a fiscal responsibility to participate in grant programs providing an incentive for applying. In addition, the City depends upon salvage revenue to replenish our General Fund, from which new equipment purchases are supported. Salvage revenue is also an important revenue stream for our contractors. (LACITY2)

Agency Response: As discussed in Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on February 5, 2008, it is expected that SOON will achieve most of expected emissions benefits through repowering vehicles. Although off-road vehicle replacement is allowed in the 2008 Carl Moyer Guidelines, the cost-effectiveness limits set by the districts must still be met for project eligibility to be determined.

Air districts participating in the SOON program are not specifically required to use Carl Moyer incentive monies to fund the SOON program. If other funding is available to a district (including funds that may apply towards vehicle replacement), those monies could potentially be used to fully fund SOON projects.

1)cc) Unlikely to be Successful if Businesses Participate Unwillingly

- Comment:** Why must businesses be potentially forced to apply if their desire for funding is nil? For this program to succeed, businesses must want to actively participate. A business that has no interest in participating will probably go through the motions and put minimal effort into the plan. (ARA4)

Agency Response: We acknowledge that the caliber of projects brought forward for the SOON program may depend on a fleet's willingness to participate in the program. For example, fleets that do not wish to participate may attempt to complete their SOON applications in a manner that will make it less likely for them to receive funding (for example, by underestimating the hours of operation). However, we believe a mandatory SOON program is necessary to obtain additional emissions reductions in the most polluted areas of the state. For an additional discussion on why the SOON program is needed, please see the response in section III-B-9)h) of this FSOR.

Additionally, ARB staff worked with the South Coast Air Quality Management District, industry representatives, and fleets potentially affected by the SOON program throughout the development process of the SOON program. We offered industry the opportunity to develop their own, voluntary SOON program that would achieve the same emissions benefits that are expected from the ARB SOON program; however, industry was unable to develop a program that would guarantee the necessary emissions reductions.

Finally, section 2449.3 includes provisions that allow fleets to specify "high priority" for SOON funding if they want to receive the funds. This will allow districts to prioritize SOON funding to fleets that actually want it, thereby increasing the likelihood of success. In ARB's review of the guidelines, we are requiring that districts take into account whether fleets indicated high priority for funding when they select projects.

1)dd) EPA Waiver

- Comment:** ARB's adoption, acceptance, or amendment of local Soon programs will constitute the adoption of an emission standard and other requirements for the control of emissions from off-road equipment under Clean Air ACT 209(e). As such, ARB will need to seek EPA's waiver of federal preemption (or, at a very lease EPA's "within the scope" determination) before ARB can enforce the SOON program in an air district. See 42 U.S.C. 7543(e)(2)(A) (waiver); see e.g., 64 FED.Reg. 42,689,42,691 (Aug. 5, 1999)('within the scope" determination). (AGCA5)

Agency Response: ARB acknowledges that the SOON program is part of the in-use off-road regulation and will, as part of its request to U.S. EPA, be requesting authorization for those parts of section 2449.3 that establish emission standards and other emission-related requirements.

1)ee) Will Shift Dirty Vehicles to Other Districts

- Comment:** Under CEQA, whether a rule has a significant, non-mitigable and adverse effect on the environment goes to whether the lead agency must prepare an Environmental Impact Report (EIR), or may simply make a negative declaration. See, e.g., Pocket Protectors v. Coty of

Sacramento, 124 Cal.App.4th 903, 907 (2004). ARB claims that the SOON program will not result in emissions increases in any participating district - pointing out the rule "includes language to prevent fleets from moving older, higher emitting vehicles into a participating air district simply to seek funding" (see Attachment 2, p.10). The staff analysis fails to consider, however, a more likely scenario in which fleets move older, higher-emitting equipment out of a participating air district to surrounding areas. The latter scenario is likely to occur, especially in districts that make the SOON program mandatory, because vehicles "scheduled to leave the district" do not need to be included in a company's NOx index calculation, NOx target rate calculation or application for funding. Under CEQA, ARB must consider that the SOON rule will cause an increase in pollution in districts that do not participate in the program. (AGCA5)

Agency Response: We do not believe that the SOON program will cause emissions disbenefits to air districts not participating in the SOON program. All vehicles eligible for the SOON program will be subject to the performance requirements of sections 2449.1 and 2449.2 of the regulation; therefore, turnover and exhaust retrofit requirements for the regulation eventually must be fulfilled by vehicles not subject to the SOON program. Additionally, off-road vehicles subject to the regulation are expected to travel between air districts regardless of the SOON program; we do not believe the SOON program will cause vehicles to travel outside the SOON air districts unnecessarily.

1)ff) Additional Public Hearing for ARB Approval of District SOON Guidelines

1. **Comment:** The SOON program contemplates that opt-in air districts will decide whether and on what terms to participate in the SOON program at duly noticed public hearings (2449.3(f)-((2)). By contrast, the ARB approval of an air district's program – which is the step that makes the opt in effective – does not require a rulemaking (2449.3(f)(3)-((4)). Specifically, ARB retains sole authority to approve each air districts administrative guidelines and, in that regard, to modify the proposed local rules in any way the Executive officer sees fit (2449.3(f)(4)). ARB also has sole authority to enforce the "SOON" program (see 2449.3(f)(4)) at the local level. AGC respectfully submits that ARB's action constitutes the amendment of a regulation, Cal. Gov't Code 11342.600, and thus requires a rulemaking (i.e., an opportunity for comment and full APA compliance at the ARB level). (AGCA5)

Agency Response: We disagree with the commenter's assertion that the Executive Officer's review of the administrative guidelines established by opt-in districts constitutes an amendment of the off-road regulation. The Executive Officer's review does not constitute adoption or implementation of rules of general applicability, but rather review to ensure consistency that existing funding and administrative guidelines (e.g., the Carl Moyer program) are followed.

1)gg) Local Authority Granted by SOON

- 1. Comment:** The SOON program states that local air district funding guidelines “may include limitations on the cost-effectiveness of projects that may be funded and must include the method used for prioritizing projects based on cost effectiveness.” This provision appears to grant the local air districts unlimited authority to control – and potentially even restrict – a fleet owner’s emissions reduction strategy. This conflicts with the underlying objective of the off-road rule, which “contains flexibility provisions to allow each fleet to find its own most cost-effective way to comply and allow(s) fleets tochoose its own best, most cost-effective path towards compliance.” What is more, AGC maintains that local governments may not have the latest information on the best strategies and technologies for the construction fleet operating within their jurisdiction. In fact, there is a danger that the best technologies would not be chosen, but instead the best salesman may get their strategy adopted whether it is appropriate for the locality or not. AGC believes it is inappropriate to give air districts that participate in the SOON program such broad authority to essentially create their own unique emission programs for off-road construction equipment. Contractors working across the state of California will face multiple compliance plan and reporting requirements and it will become unduly burdensome (and unnecessarily complicated) for construction companies to demonstrate multi-district compliance. In addition, a patchwork of different emission reduction requirements would undermine the ability of manufacturers of equipment, engines and emissions control devices to produce effective products and to meet customer demand. Contractors working in more than one jurisdiction may not be able to use particular pieces of equipment in other jurisdictions. (AGCA5)

Agency Response: The requirements of the regulation, and specifically, the emission targets of the SOON program, have been adopted by the Board. The SOON program was designed to get additional, early emissions reductions above and beyond the requirements of the statewide regulation. Although some fleet owners may feel this takes away some of the flexibility of the general regulation, the Board felt that the SOON program was necessary to achieve additional emissions reductions in the most polluted areas of the state.

The SOON program does not delegate authority to local air districts to adopt more stringent emission standards for off-road vehicles. For an additional discussion of this issue, including the issue of multi-district compliance, see the response in section III-C-1)c) in this FSOR.

1)hh) Mandate Compatible District Guidelines

- 1. Comment:** AGC requests that ARB amend the SOON rule to mandate that district plans be compatible. As currently written, the rule requires only that ARB “consider...uniformity of district guidelines between air districts.” AGC also requests that the SOON rule clearly state that air districts do not have the authority to dictate the best strategies and/or technologies for the construction fleet operating within their jurisdiction. In addition, AGC believes that the statewide opt-in framework is overly broad. Because the excess NOx reductions are only needed in two air districts – South Coast Air Quality Management District (SCAQMD) and the San Joaquin Valley Pollution Control District (SJVAPCD) – ARB should limit the SOON program to only those areas. A more tailored and narrowly focused SOON program would decrease the rule’s burden on contractors who operate throughout the State. (AGCA5)
- 2. Comment:** SOON was intended to assist the two air districts in California that need to meet 2014 deadline to achieve compliance with the Federal PM 2.5 standard. Both of those districts are approaching the program differently and it will result in confusing and conflicting requirements for contractors who operate in multiple districts. It would appear that there are fewer than 100 fleets that are subject to SOON in South Coast and San Joaquin districts, and those fleets may operate in both districts. It is unfair for them to have to comply with a patchwork of rules from the CARB base rule and local SOON programs. Adding other districts to the regulation will only compound the confusion. CARB needs to guarantee that the SOON provisions are consistent district-to-district. (LEWIS3)

Agency Response: As stated in the response in section III-C-1)c) in this FSOR, the Board debated the issue of which districts should be eligible to participate in the SOON program and directed the staff to allow all California air districts to opt in to the SOON program during the public hearings in Sacramento on July 26, 2008. The South Coast and San Joaquin Valley District are not the only districts in need of additional NOx reductions to demonstrate attainment. Section 2449.3 recognizes South Coast and San Joaquin Valley’s greater need by allowing them to make the program mandatory a year earlier than other districts.

Although the current regulation language allows air districts to create their own guidelines for projects funded through SOON in their district, ARB must review and give final approval to all programs implemented by local air districts. Approval by the staff depends in part on the consistency between the guidelines set up by the various air districts that opt in to SOON.

1)ii) SOON New Regulation Under APA

- 1. Comment:** The APA requires supplemental proposals undergo a “15-day” notice process where the change is “sufficiently related to the original

text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action.” Cal. Gov’t Code §11346.8(c)(2). Where a revision does not meet the “sufficiently related” test, the APA requires agencies to recommence the full APA process for that new rule (e.g., an initial statement of reasons, the opportunity for a hearing, etc.) The SOON program is in no way an outgrowth of the underlying ORD proposal, and ARB must recommence the full APA rulemaking process for the SOON program. As explained in AGC’s prior comments, ARB’s enabling legislation, the APA, and CEQA impose various requirements on ARB’s setting of emission standards (e.g., cost effectiveness, feasibility, considering alternatives). When ARB adopts a new or revised standard, ARB must comply with these requirements anew. See, e.g., Cal. Gov’t Code §11346.5(a)(4) (notice of proposed adoption shall include other information required by statute). Here, ARB must comply with the full range of information required for a new emission standard. (AGCA5)

2. **Comment:** Under California law, the SOON program cannot be promulgated under 15-day comment provisions of Cal Gov Code §11346.8 Under California Law:

No state agency may adopt, amend, or repeal a regulation which has been changed from that which was originally made available to the public pursuant to Section 11346.5, unless the change is non-substantial or solely grammatical in nature or sufficiently related to the original text that the public was adequately placed on notice that the change could result from the originally proposed regulatory action.

Cal Gov Code §11346.8(c). Only a “sufficiently related” change to the original regulation may be adopted under the 15-day comment process. (Given its use of the 15-day comment process, ARB presumably recognizes the fact that the SOON is not a “solely grammatical” or “non-substantial” change to the ORD rule. See CCR 40 [changes are non-substantial “if they clarify without materially altering the requirements, rights, responsibilities, conditions, or prescriptions contained in the original text.”]) A change to the original text of a regulation is deemed to be “sufficiently related” only “if a reasonable member of the directly affected public could have determined from the notice that these changes to the regulation could have resulted.” 1 CCR 42

While the SOON program is related, in limited respects, to the state-wide regulatory regime embodied in the ORD rule, the SOON constituted a separate and distinct opt-in program to allow local Air Districts to impose a mandatory system for funding and achieving additional NOx reductions above and beyond those required under the ORD Rule. The SOON program is not merely an amendment or “change” to the ORD Rule

provisions, and therefore the program cannot be implemented as a “change” under the 15-day notice and comment provision of Cal Gov Code §11346.8(c).

In any event, even if the SOON program could be deemed merely a “change” to the original ORD Rule proposal, it is not “substantially related.” Nothing in the original notice for the ORD Rule issued by ARB in April 2007 under Cal Gov Code §11346.5 would have allowed a reasonable member of the public to determine that the SOON program could have resulted. Indeed, the SOON concept and its specific provisions were not contemplated publicly until the very end of the rulemaking process – literally the evening before the Board’s final vote to adopt the ORD Rule. For these reasons, the SOON program cannot be adopted under the truncated 15-day notice and comment process, but must be pursued under the ordinary notice-and comment procedures set forth in the California Government Code, including Sections 11346.4 and 11346.5. For these reasons, ARB must vacate Resolution 07-19 and provide the public announcement and full 45-day period for the SOON program required by the California Government Code. (ATA3)

Agency Response: For the reasons set forth in the agency’s response to comments in Chapter III-A-19 in section III-A-19 and in the response to comments of the first 15-Day Notice (section III-B-19) from JOSEPH of this FSOR, ARB does not believe that the inclusion of the SOON program as part of this regulation violates either the APA or CEQA. The SOON program, as adopted, falls within the scope of the initial Notice for this regulation in that it is substantially related to the NOx fleet average requirements and the notification that the Board might consider changes to strengthen the regulation to ensure compliance with federal national ambient air quality standards and to provide greater flexibility for stakeholders. As previously mentioned, stakeholders from both the environmental community and regulated stakeholders understood that the SOON proposal addressed these two noticed needs. For example, see testimony of Mike Lewis of CIAQC at the July 26, 2007, board meeting.

1)jj) Omit SOON Vehicles from Fleet Average Calculations

- Comment:** According to ARB, reductions achieved through the SOON program funding cannot be credited toward fleet compliance with the in-use off-road regulation. Instead, action taken using SOON program funding must be ignored (when determining compliance with fleet average targets or minimum BACT requirements) until the contract period has expired for any given piece of equipment. AGC understands that SOON program reductions would not be surplus for fleets that comply via the ORD rule’s BACT option, but that is not true for fleets that comply via the ORD rule’s fleet-average option. It is unfair to force fleets to carry clean units at fictitious “Tier 0” emissions levels for the seven-year life of a

SOON program contract, which essentially will require those fleets to over-control the rest of their fleets to make up for “ghost” emissions that the fleet does not actually emit. To avoid forcing fleets to carry “ghost” emissions from a Tier 0 unit that the fleet does not actually operate, the ORD rule should simply omit SOON program vehicles from the fleet-average calculation. (AGCA5)

Agency Response: We do not agree with omitting vehicles used in the SOON program from the fleet average calculations. If the vehicles upgraded from the SOON program were dropped from the fleet averages, it would essentially appear as if the vehicles were retired from the fleet; this would result in a decrease in both the PM and NOx fleet averages. Therefore, the fleet receiving SOON funding would get credit for a partial cleanup of the vehicles funded. SOON money would be paying fleets to comply; and early emissions reductions would not be fully realized.

Finally, if credit were given to a fleet under section 2449.1 for improvements made under SOON, the emission reductions could not be considered surplus and in that case would not qualify for SOON funding.

1)kk) SOON Removes Exemptions from Off-road Regulation

1. **Comment:** The SOON rule states that “vehicles that are replaced or repowered with SOON program funds” cannot take advantage of the ORD rule’s “exemption from (PM exhaust) retrofit requirements for vehicles less than 5 years old” (see 2449.3(e)(6)(a)). Similarly, vehicles that are covered by the SOON rule cannot take advantage of the off-road rule’s exemption from turnover requirements that is afforded to “vehicles less than 10 years old” (see 2449.3(e)(2)). It is inappropriate for ARB staff to take away, via a SOON provision, flexibility that ARB’s Board approved into the baseline off-road rule. Indeed, it exceeds ARB’s staff permissibly delegated authority to take these actions into the SOON program without returning the issue to the ARB Board. (AGCA5)

Agency Response: SOON was created to achieve additional NOx emissions reductions, and exempting vehicles less than 10 years-old from the program might prevent some of those reductions from occurring. Additionally, we wanted to preserve the base statewide regulation benefits, and did not want any reductions in PM benefits to occur by allowing the exemption from the VDECS requirements for vehicles less than 5 years-old. For example, if SOON paid to replace a Tier 0 vehicle with a Tier 3 vehicle and the Tier 3 vehicle qualified for the exemption for vehicles less than 5 years old, whereas the Tier 0 vehicle would not have and would have been retrofitted under the base statewide rule, exempting the Tier 3 vehicle from retrofit requirements could result in higher PM emissions than if the original Tier 0 vehicle had been retrofitted. However, we do not anticipate that many SOON vehicles will be able to take advantage of this provision; the exemption from the VDECS requirements applies to vehicles less

than 5 years-old, not engines less than 5 years-old. We expect that most SOON vehicles will be older than 5 years old and will be repowered; therefore, although the engine will be new, the vehicle, itself will not and therefore would not qualify for the exemption from the retrofit requirements anyway.

1)II) Socioeconomic Study on SOON

- 1. Comment:** Recognizing that the SOON program may “increase the estimated cost of the off-road regulation in its initial years of implementation,” ARB must revisit its cost-effectiveness calculation for the off-road rule. This is because the SOON program will fund the most cost-effective projects in a fleet earlier than they would be controlled by the statewide requirements in the off-road rule. As ARB explains:

Older Tier 0 vehicles are the more cost-effective relative to newer vehicles to turn over because they have less useful life remaining and because of large emissions reductions associated with repowering Tier 0 engines to a Tier 3 level. Tier 0 vehicles are required to be turned over first in the off-road regulation if a fleet is on the BACT path. Therefore, when the cost analysis was performed for the off-road regulation, it was assumed that these vehicles were turned over first at little cost to the fleet.

Because older Tier 0 vehicles will now be included in the SOON program, fleets will be forced to control less cost-effective vehicles (such as newer Tier machines) for compliance with the off-road rule. Accordingly, the SOON program’s addition requires ARB to update its cost-effectiveness determinations for the underlying ORD rule. (AGCA5)

- 2. Comment:** CARB must perform a Socio-Economic Impact Study that includes both the SOON program and the Base Rule. The SOON program will require fleets to turnover equipment at a rate greater than would be necessary to achieve NOx fleet averages and, well above the 8percent per year level companies pushed into the Best Available Control Technologies (BACT) path will need to sustain. The costs for this must be analyzed. During the development of the regulation and the State Implementation Plan, the South Coast Air Quality Management District asked CARB to consider a BACT path equivalent of 15 percent for the South Coast. CARB recognized that this rate of turnover would be too costly and unsustainable. For these reasons, CARB staff must perform a Socio-Economic Impact analysis that examines the real costs of the SOON program that requires additional vehicle turnover as a component of the Off-Road regulation. Equally important is that this analysis should be made publicly available for review and comment before the regulation is finalized. (LEWISM3)
- 3. Comment:** Has CARB performed a Socio-Economic Impact study on the costs associated with not only the base Off-Road rule, but the SOON Opt-

in rule as well? If so, it has not been seen. I thought there was a legal requirement that these types of studies be performed so that there is a full understanding of the costs associated with implementation of these types of regulations. The adoption of the SOON program was added to the Off-Road regulation the day of the hearing. The proposed SOON program originated in the South Coast Air Quality Management District (SCAQMD) and a draft was discussed with representatives from our industry merely two weeks before the CARB hearing. Additionally, what was presented to the Board was far from what the Construction Industry had recommended to make this program work, including SCAQMD's decision to make the program mandatory and to not fully fund the projects. How is it possible to move it along so swiftly? Did CARB follow the public notice and administrative requirements? To my knowledge, no comment period or public workshops were ever held to garner public comment as to the specifics of this rule, and no Socio-Economic Impact Studies were performed to document the costs associated with this Opt-In program. It seems to me that some may be able to assert that CARB is implementing a regulation without the necessary supporting studies process required under State law. (ECCO6)

Agency Response: The SOON program is not expected to affect the cost-effectiveness of the regulation. For a discussion of the costs associated with SOON, please see Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents on made available on February 5, 2008.

For a discussion on why SOON is not a voluntary program, please see the response in section III-C-1)f) of this FSOR. For a discussion on why SOON is not fully funded, please see the response in section III-A-9)b) of this FSOR.

For a discussion of why we believe ARB followed all public notice requirements and requirements of the Administrative Procedures Act, please see the response in section III-C-1)ii) of this chapter.

Additionally, please see the response in section III-C-1)uu) of this FSOR for a discussion on the time allowed for comments on the SOON program.

1)mm) SOON and VDECS

- Comment:** Attachment 2: Description of the Surplus Off-Road Opt-in for NOx (SOON) program, is unclear on whether or not the program requires and/or provides funds for diesel retrofit. The document indicates that "fleets can apply for funding for NOx exhaust retrofits..." (Attachment 2, p.7), but it goes on to state that "the SOON program will not fund, and will not require VDECS installations on SOON vehicles". The latter statement seems to contradict the text of the SOON rule, which includes retrofit in the definition of "project" and also references retrofit in the section that

covers funding application procedures (see §§2449.3(c)(3) and 2449.3(d)(1)(D)). Indeed, even the air districts appear to be confused as both the SCAQMD and SJVAPCD SOON guidelines indicate the retrofit devices are eligible for SOON funding. In addition, SCAQMD states that “for all repower projects, fleets must install the highest level VDECS...” and SOON funded projects will be required to install verified particulate traps (if available) that must be funded by the fleet owner. AGC request further clarification on how the SOON program applies to diesel retrofit. (AGCA5)

Agency Response: Commenter AGCA5 may have been confused by the terms retrofit and VDECS; a PM VDECS is not required, but a NOx VDECS could potentially be funded as a SOON eligible project to reduce NOx.

As stated in section 2449.3(e)(6)c., a fleet that receives SOON funding is not required to install the highest level VDECS in conjunction with the SOON funded action; as used in section 2449.3(e)(6)c., the term VDECS is meant to encompass PM VDECS only. The 2005 Carl Moyer guidelines contained a requirement that the highest level VDECS had to be installed at the time of a funded repower; however, since the SOON program was created to achieve early NOx reductions, this requirement was removed.

When a fleet applies for SOON funding, it is possible to apply for an engine repower, a vehicle replacement, or a NOx VDECS if available.

1)nn) Redo the SOON Program and the Off-road Regulation

- 1. Comment:** The Board should revisit its entire ORD-SOON regulation, starting with consultation with affected public agencies and stakeholders and opening its consideration of alternatives to include region-specific regulation tied to federal nonattainment status and funding targeted to the federal nonattainment areas. (AGCA5)
- 2. Comment:** ARB resolution 07-19 must be vacated. The ORD Rule should be replaced with an approach that achieves the needed emission reductions in a more cost-effective manner, and that minimizes burdens on the National Airspace system. (ATA3)
- 3. Comment:** I have no incentive to try and work this out because the air district is mandating that work to be done to my equipment that I cannot afford to do and that I don't want to do because I am in compliance with all current regulations. If my fleet is currently in compliance with the air quality requirements of the State of California, how can I be mandated to participate in this program? How can I be compelled to spend money I do not have a need to spend, to give up real equity (value) in my machinery, to have my ability to contract diminished and have my ability to use my equipment as I need arbitrarily constrained without my willing

participation? A more honest and thorough analysis, including real consideration for the input from industry, should be made before any form of this program is considered for implementation. I would expect that if this program is presented as a voluntary program with more reasonable constraints, it might be as effective as the Moyer program has been to date. (SHAWM3) (LEWISM3) (LEWISM4)

Agency Response: We disagree. For a discussion of why this regulation is necessary, please see the response in Chapter III-A-17.

The Construction Industry Air Quality Coalition (CIAQC) and Mike Lewis, its senior vice president, were very involved prior to the July 26, 2007, Board meeting in discussing and attempting to craft the SOON proposal. As Mr. Lewis testified at the July 26, 2007 board meeting, Mr. Lewis and members of CIAQC met with ARB and South Coast Air District staff on this topic in the weeks leading up to the July 26, 2007, meeting.

Additionally, ARB staff worked with the South Coast Air Quality Management District, industry representatives, and fleets potentially affected by the SOON program throughout the development process of the SOON program after the July 26, 2007, board meeting. We offered the industry (including CIAQC) the opportunity to develop their own, voluntary SOON program that would achieve the same emissions benefits in specific local air districts that are expected from the ARB SOON program; however, industry was unable to develop a program that would guarantee the necessary emissions reductions.

For an additional discussion on why the SOON program can be made mandatory, please see the response in section III-C-1)f) of this FSOR.

The regulation is cost-effective; see the response in section III-A-3)d)v) of this FSOR.

The regulation has attempted to minimize the cost burden imposed on GSE and the national airspace system. See discussions on credits for use of electric replacements in the response in section III-A-6)d)i)3) of this FSOR; exemptions for unavailability of Tier 3 and 4 engines, VDECS, and unsafe VDECS in sections III-A-2ci1, III-A-2)a), and III-A-2)a)ii), respectively, in Chapter III-A-2 of this FSOR; and federal preemption in Chapter 19 of this FSOR.

1)oo) SOON and GSE

- 1. Comment:** The SOON regulation purports to authorize local air Districts to make participation “mandatory” starting in 2010 (or 2009 for the South Coast and San Joaquin Valley). See SOON Section 2449.3(e)(9). Fleets meeting the statewide horsepower and composition levels of the SOON, with equipment operating in a “mandatory” district, would be required: (1) to apply for funding by responding to District Solicitations; and (2) to

“complete the actions for which they were funded per the condition of the solicitation.” Id. Section 2449.3(d)(1)(D), (E). The SOON purports to authorize local air Districts to adopt guidelines that “include a preapplication process that collects vehicle data (model year, horsepower, hours of use) and then requires full SOON project applications only for vehicles likely to receive funding.” Id. Section 2449.3(f)(2). These and other provisions that render SOON participation mandatory rather than voluntary are contrary to state and federal law in a number of respects, including the following. First, with respect to GSE in particular, states and localities are preempted under ADA and Federal Aviation Act from selecting particular units of GSE that must be modified or replaced, or mandating the timetable for such intrusive changes. As set forth in detail in ATA’s previous comments, GSE is inextricably intertwined with the provisions of airline transportation service and selection of routes (and thus ticket prices), and to the safe and efficient movement and operation of aircraft in the National Airspace System. See, e.g., ATA July 25 Comments at 45-54. Indeed, the concerns set forth in ATA’s previous comments are in many respects even more problematic as applied to the SOON, given the highly intrusive and ill-defined powers the SOON would give localities to mandate changes to GSE. By purporting to authorize each local air District in California to impose its own unchecked mandates dictating specific changes to specific units of GSE, with no regard to the overriding federal considerations of safety, efficiency, and risks of disruptions to air travel, the SOON is plainly preempted by the ADA and Federal Aviation Act. See, e.g., id.; see also Rowe, slip op. at 4-11 (ADA preempts state laws “having a connection with” airline services, even if the effect “is only indirect”); Montalvo, 508 F.3d at 472 (holding that the federal Aviation Act preempts the field of aviation safety and recognizing Congress’ intent that the FAA be the “sole arbiter of air safety”). (ATA3)

Agency Response: We disagree. For a further discussion on ARB’s authority to regulate GSE, please see the responses in Chapter III-A-19 of this FSOR.

For a discussion on why SOON is not a voluntary program, please see the response in section III-C-1)f) in this chapter of this FSOR.

1)pp) Insufficient Time for Public Comment on SOON

- 1. Comment:** Moreover, separate and apart from whether 45-day or 15-day notice-and-comment procedures are applicable, in adopting the SOON ARB has failed once again to comply with fundamental prerequisites of the public rulemaking process under California Law. ARB staff did not announce or make public the proposed SOON provisions until the evening before the Board’s definitive vote to adopt it at the hearing on July 26, 2007. Thus, ARB failed to provide any meaningful opportunity for public comment on the SOON provisions. As ARB staff recognizes in the Second Notice, the Board made the final decision to adopt SOON on July

26 without any significant opportunity for submission or consideration or public comments. (ATA3)

Agency Response: We disagree. We did not state in the Second Notice of Public Availability of Modified Text and Availability of Additional Documents that the Board made the final decision to adopt SOON on July 26 without any significant opportunity for submission or consideration or public comments. The program was discussed at length at the board meeting and, as reflected in the transcripts from the board meeting, many commenters, including Mike Lewis, senior vice president of CIAQC, commented regarding the SOON program.

Since the board hearing on July 26, 2007, ARB staff has worked closely with the South Coast Air Quality Management District (SCAQMD), a non-attainment district for federal and state standards, and affected fleets to modify and refine the SOON program. ARB staff released the SOON language for public comment in the Second Notice of Public Availability of Modified Text on February 5, 2008, which provided for a 30-day public comment period. Staff believes the revised SOON program will help the SCAQMD and other non-attainment districts to meet their attainment deadlines, while not imposing additional financial hardship on affected fleets.

Finally, as described in the response in section III-C-1)ii) of this chapter, the SOON program, as adopted, falls within the scope of the initial Notice for this regulation

1)qq) Consistency with Carl Moyer Guidelines

1. **Comment:** Nothing in the Carl Moyer legislation or guidelines, or any other authority, contemplates that ARB or local air Districts may mandate that entities apply for or accept Carl Moyer funds. See, e.g., Cal Health and Safety Code, Chapter 9. To the contrary, the framework and language of the Carl Moyer legislation and ARB's implementing guidelines make clear that the program is to be based on financial "incentives" and that participation is to be voluntary. See, e.g., Cal Health and Safety Code §44290 (requiring ARB and Districts to implement an outreach program to inform potential participants "of the availability of grants," and requiring that ARB and Districts "shall vigorously recruit grant applications"); id §44280 (the program is to "provide grants"); The Carl Moyer Program Guidelines Part II, Project Criteria, at I-1 (Nov. 17, 2005) (the program "provides financial incentives"). This is further confirmed by the almost exclusive focus of the Carl Moyer legislation and ARB guidelines in setting "eligibility" criteria for awarding grants to "applicants". The SOON would impermissibly seek to divert funds earmarked by the legislature for grants intended to give financial incentives to interested parties to achieve excess emissions reductions, and use those funds instead to provide a mechanism for ARB and Districts to impose intrusive and ill-defined mandates on private parties that have either determined that they do not

want or need a financial incentive, or who are unwilling to agree to abide by the terms associated with the acceptance of state funds. In this regard, the SOON would misuse Carl Moyer Program funds, is inconsistent with the statute and ARB's own implementing guidelines, and is contrary to law.

The Carl Moyer Program is intended to fund the “incremental cost” of projects that achieve emission reductions above and beyond what is already required by regulation. See, e.g., Cal Health and Safety Code §44280(b), 44281(b). As ARB recognizes in the current guidelines, Carl Moyer “is a grant program that funds the incremental cost of cleaner-than-required engines, equipment, and other sources of air pollution.” See Carl Moyer Program Guidelines, Part I (Release date January 6, 2006) at I-1.

The statute makes clear that the funds are intended to “offset the incremental cost of projects” for the parties who receive the funds. Cal Health and Safety Code 44280(b) (“The program shall provide grants to offset the incremental cost of projects that reduce covered emissions from covered sources in California”). However, rather than being used to offset the actual incremental cost of achieving additional emission reductions, the SOON would use Carl Moyer funds for emission reduction measures that would otherwise be required by the ORD rule. The SOON program would then require the fleet to bear the entire cost of making subsequent additional emission reductions, which ARB recognizes are likely to be more expensive than the measures funded under SOON. See Second Notice, Attachment 2 at 5 (the SOON program may “force” fleets “to choose actions for statewide rule compliance that are more expensive” than other wise). In other words, rather than being used to “offset” the true incremental cost of achieving additional emission reductions, the SOON program would use Carl Moyer funds to reimburse fleets for making cheaper “low-hanging fruit” changes already required under the ORD Rule, and then mandate that those fleets pay the entire costs of making the expensive changes required to achieve additional reductions. The SOON program would thus inappropriately allocate Carl Moyer funds without regard to the actual cost of the additional, incremental reductions, which the fleet owner would be obliged to bear without reimbursement.

(ATA3)

Agency Response: The SOON program does not mandate the use of Carl Moyer Program funds, rather, Carl Moyer Program funds are just one possible source of funding available to districts. While historically the Carl Moyer Program has been a purely voluntary program with no requirements for fleets to apply for funding, neither the California Health and Safety Code nor the Carl Moyer Program Guidelines prohibit ARB or the local air districts from compelling fleets to apply for funding. As detailed in section 2249.3(d)(1)(E) of the SOON regulatory language, fleets, or applicants, are only required to take actions beyond applying for SOON funding if a project is selected and a grant is

provided. If a grant is not provided, then the applicant is only required to comply with the in-use off-road diesel vehicle regulation. Section 2449.3(f) of the regulations provides the framework for ARB to verify that the Carl Moyer Program Guidelines are followed and that, in accordance with the Carl Moyer Program Guidelines, any case-by case approvals that have been granted by ARB are appropriately incorporated into the district's guidelines. Case-by-case approvals that have currently been granted to SOON funded projects are: 1) the use of compliance plans to ensure surplus emission reductions, 2) removal of the retrofit requirement on repowers, 3) and the allowance for recently rebuilt engines to be eligible for up to 100 percent of the cost of the repower.

California Health and Safety Code section 44275 (a)(12) defines incremental cost as the cost of the project less a baseline cost that would otherwise be incurred by the applicant in the normal in the normal course of business. Historically, ARB has interpreted the "normal course of doing business" for repowers as the cost of rebuilding the existing engine. This interpretation has not changed with the adoption of the in-use off-road diesel vehicle regulation and the SOON provisions. Regardless of whether Carl Moyer Program funds are being used to pay for early emission reductions generated through the SOON program or those generated for statewide rule compliance as permitted by the Carl Moyer Program Guidelines, the projects are subject to the same statutory and Guideline requirements such as being surplus to regulatory requirements and meeting the cost-effectiveness limit.

Additionally, as discussed in the response in section III-C-1)o) of this FSOR, if a fleet has vehicles that must comply with the SOON program, there is no mandate that the fleet must apply for or accept Carl Moyer funds; the fleet effectively has several options. It may apply for SOON funding, which would entail, if granted, that it enter into a contract with the opt-in district pursuant to the fleet funding guidelines adopted by the air district and approved by ARB. Alternatively, it may choose to meet the SOON targets using its own funds, move vehicles permanently out of the air district, or establish that vehicles would be moved out of the air district during the period of SOON funding and would not operate sufficient hours within the district to qualify for SOON funding.

With the adoption of the in-use vehicle regulations, the normal course of business has and will continue to change in California. As discussed in Attachment 2 of the Second Notice of Availability of Modified Text, the SOON program may force fleets to change their compliance plans for the statewide rule, thereby forcing higher compliance costs. If the SOON program forces more cost-effective projects into the Carl Moyer Program than would have happened otherwise, the Carl Moyer Program will actually achieve greater emission reductions providing a better use of state funds.

1)rr) Preference for Repowering over Replacement

- 1. Comment:** Because of the lack of incentive funding for equipment replacements and a local plan, air districts will channel grant funding for early off-road regulation compliance and/or SOON compliance into repower projects. In fact, the proposed 2008 Moyer Guidelines require that repowers be considered before replacements can be funded. Off-road equipment repowers, however, are not in all instances a cost-effective solution for many fleets for two reasons: a) it often does not make economic sense to repower a unit that has a chassis, housing or electronics that will not last as long as the new engine, such as is the case for a lot of Tier 0 equipment the City owns (the only equipment eligible for replacement funds under Moyer 2008 guidelines are Tier 0) and b) many pieces of Tier 0 equipment cannot be adapted to newer engine configurations and electronics needed for repowers. In addition, some fleets prefer to simply replace the vehicle, rather than dedicate limited personnel to the increased maintenance required for a repower project. For example, repower projects require increased vehicle frame maintenance to ensure vehicle dependability and to decrease the risk of costly vehicle liability issues and claims. We wish to keep the repower vs. replacement choice open for fleets that wish to replace rather than repower. To return a higher incentive to vehicle replacement projects and slightly broaden equipment owners' choices, we recommend the following: 1) an exemption to the Moyer Guidelines scrapping provision for equipment replacements under the SOON element, and 2) an exemption to the Moyer Guidelines preference toward repower versus replacements for both the SOON element and for the base off-road regulation.
(LACITY2)

Agency Response: As discussed in the response in section III-C-1)g) of this FSOR, the ARB Carl Moyer program has been revised and now allows funding for vehicle replacements; the ARB program does not give preference to any one type of project (such as a preference toward repowers versus replacements).

Air districts participating in the SOON program are not specifically required to use Carl Moyer incentive monies to fund the SOON program. If other funding is available to a district (including funds that may have no incremental cost requirements), those monies could potentially be used to fully fund SOON projects.

Additionally, if Carl Moyer program monies are used, we do not have the authority in the context of the SOON program to modify the provisions in the 2008 Carl Moyer guidelines.

1)ss) Accounting for the SOON Program

- 1. Comment:** The SOON program requires a 3-year contract where emissions benefits are guaranteed. How does this requirement fit with an equipment replacement model? Suppose SOON funding is used to accelerate fleet turnover in a rental fleet. The project is the 1-year advanced replacement of a unit. Is the life of the benefit 1 year because the unit would have been replaced anyway the next year? (ARA4)

Agency Response: The project life, or contract period, of a SOON vehicle is determined by the air district guidelines, not by the ARB SOON regulatory language. Therefore, the ARB SOON program does not specify that a 3-year contract is required.

However, if a district requires a 3 year project life for a SOON vehicle, it means that vehicle cannot be counted towards compliance with the off-road regulation for 3 years. Additionally, if a fleet is planning on selling a vehicle, or moving that vehicle out of a district, the fleet could apply for an exemption for that vehicle from the SOON program.

1)tt) Reconsider CIAQC Suggestions for SOON

- 1. Comment:** CARB needs to reevaluate the CIAQC recommendations. CIAQC worked diligently with the South Coast air district staff to craft a SOON program that would achieve the emissions reductions desired by the district. Despite the lack of time and the need to focus on the impacts of the CARB base rule, industry representatives spent innumerable hours trying to shape the SOON program. We made very specific recommendations to CARB staff outlining what it would take for contractors to be able to participate in the program. Those recommendations included the multi-year targets for fleet average milestones and the integration of the base rule and the SOON requirements. The SOON language that was presented at the last minute to your Board on July 26 has significant deviations from what the construction industry had recommended to SCAQMD staff, including changes to make the program mandatory and not fully funded. CARB staff also failed to examine the cost effectiveness or the reduced compliance burden of the construction industry alternative. Those recommendations were quickly rejected by CARB staff and now the need to be re-examined in light of the collapse of the SOON program as a viable emission reduction program. (LEWISM3)

Agency Response: ARB staff worked with the South Coast Air Quality Management District, industry representatives, and fleets potentially affected by the SOON program throughout the development process of the SOON program. In December 2007, we offered the CIAQC the opportunity to suggest an alternative to the SOON program that would achieve the same emissions

benefits that are expected from the ARB SOON program but that would be completely voluntary. After checking with their members, CIAQC was unable to suggest such a program that would guarantee the necessary emissions reductions.

For a discussion on why staff did not agree to multi-year targets, please see the response in section III-A-9)d) of this FSOR.

For a discussion on why SOON is not a voluntary program, please see the response in section III-C-1)f) of this FSOR. For a discussion on why SOON is not fully funded, please see the response in section III-A-9)b) of this FSOR.

For an economic and cost-effectiveness discussion of the SOON program, please see Attachment 2: Description of Surplus Off-Road Opt-in for NOx (SOON) Program to the Second Notice of Public Availability of Modified Text and Availability of Additional Documents released on Feb. 5, 2008.

1)uu) SOON Too Rushed

1. **Comment:** Quite simply the SOON Program's development and adoption was too rushed. It took nearly four years to develop the off-road rule. The SOON program was first discussed just six weeks before the Board adopted it. There was insufficient time to understand the implications of the program or the barriers that would arise to the implementation of the program. There was only minimal stakeholder involvement. Initially the staff recommended against the idea. The recommendations presented by industry to provide flexibility were rejected at the last minute. As a consequence, we are now struck with an adopted rule that most agree is not going to work in its current configuration. At this point it appears that the staff intends to merely add bandages to the program in an attempt to fix it. This approach is not going to work. If Carl Moyer funding is going to provide the framework for SOON, then the program needs to be redone to focus on the very limited pool of equipment and emissions that are the intended target. (LEWISM3)

Agency Response: We disagree. Since the board hearing on July 26, 2007, ARB staff has worked closely with the South Coast Air Quality Management District (SCAQMD), a non-attainment district for federal and state standards, and affected fleets to modify and refine the SOON program. After significant revision, ARB staff released the SOON language in the Second Notice of Public Availability of Modified Text on February 5, 2008, and extended the required 15-day public comment period to 30 days, allowing additional time for stakeholder comments. Staff believes the revised SOON program will help the SCAQMD and other non-attainment districts to meet their attainment deadlines, while not imposing significant additional financial hardship on affected fleets.

Additionally, ARB staff has been working closely with the SCAQMD as they develop their SOON district guidelines. A SOON working group has been formed to aid in this guideline development process, and includes ARB staff, SCAQMD staff, and affected fleets that operate within the South Coast Air District. ARB staff will continue to work with the SCAQMD on their SOON district guidelines, and will also encourage other districts interested in the SOON program to develop similar SOON working groups which include stakeholder involvement.

2. Other 2nd 15-day Comments

2)a) Compliance Extensions for VDECS

1. Comment: Regarding the in-use off-road diesel rule, n previous comments and written documents given to staff and to Board Members at the Board meeting in San Diego, we have provided quotes for DPF units from a major European Company that is verified for level three VDECS. These units were quoted for Tier 0 engines. Please refer to the DPF quoted prices that I included in my comments dated May 16 2007. We expressed our concerns about the capabilities of these units to work properly on our high horsepower engines while working in the California terrain. We were told that these units have been well tested in the European market and that they could handle what ever we could throw at them. Camarillo Engineering Inc. has been working very hard on a compliance strategy and every time it comes to the retrofit for PM Emissions, we run into problems. We are now told that the same company that quoted them in May of 2007 will no longer quote Tier 0 engines for retrofit PM devices. This same company gave testimony at the meeting in Sacramento in July of 2007 that stated they could take care of the construction industry needs for PM devices. The California Air Resources Board voted to Implement the in use off-road diesel regulation without thorough testing of these devices on the high horsepower Tier 0 engines that we will be required to retrofit. After realizing that one of our options had been eliminated, at least for now we opted to get quotes on 10% of our Tier 1 horsepower. We were informed that in order to get quotes on Tier 1 engines that we would have to do opacity tests first. We went with our Caterpillar dealer and took the opacity tests on that 10% of our Tier 1 engines. We then submitted those results to the same DPF provider that had once quoted our Tier 0 engines. The DPF provider would only quote the low horsepower engines and declined to quote the higher horsepower Caterpillar flexed Tier 1 engines because they are basically as dirty as Tier 0 engines. With that news we asked what our options on those machines would be if we decided to keep them. Four of these machines are Caterpillar model D-400E articulated rock trucks. Caterpillar only has a real Tier 1 engine available at this time to repower them. So now we could spend \$100,000.00 each to repower to Tier 1 just so we could get a quote to retrofit them with PM devices. After trying to digest that wonderful news

we asked for quotes to retrofit our Caterpillar 651B Scrapers that have already been repowered to Tier 2 engines of which we have repowered 17 engines to Tier 2. After waiting a week for an answer and I might add that I called at least once a day every day trying to get a quote. I was informed on March 5th 2008 at around 4:30pm that the DPF provider has declined to quote the PM devices to sit on top of our Tier 2 engines. We here at Camarillo Engineering Inc. are really trying to put a financing package together to repower our Tier 0 fleet to Tier 3 and to come up with a retrofit strategy that we can work with. We feel that we are being forced to use technology that will cost us millions of dollars that might not live up to expectations. Camarillo Engineering Inc. has been a progressive steward of the environment and we will stay that course. In this time of economic turmoil, the virtually non-existent housing market all contractors are suffering great losses. We implore you to rethink the time lines you are going to require the construction industry to live with in this regulation. When we look at the regulation and what it requires from the end user it hardly seems fair that because of prior agreements that the major manufacturers of the equipment that we use in the State of California are not held to the same standards. (CAMARILLO6)

Agency Response: We acknowledge that the market for VDECS in California is relatively new and changing rapidly, and that there is a learning curve for fleets as they explore the use of VDECS with their vehicles. We regret the frustrating situations described by the commenter. We also recognize that Huss system is no longer being offered for some high horsepower vehicles; which means there may currently be no highest level VDECS available for these higher horsepower vehicles. The regulation's definition of highest level VDECS provides that if the VDECS manufacturer and installer agree that a VDECS cannot be used, then that VDECS will not be considered a highest level VDECS. It may be the case that for some vehicles in the commenter's fleet there is currently no highest level VDECS available, in which case the regulation exempts those vehicles from the retrofit requirement.

Finally, as described in the responses in section III-A-2)a) of this FSOR, there are several new systems that have been recently verified – including the Caterpillar and DCL systems – that the commenter may wish to research. We also expect that new systems will become verified through the off-road showcase demonstration project.

Finally, if a VDECS company has unresponsive customer service, as alluded to in the comment, then we expect that as more systems become available, competition will drive the company to improve its customer service or lose business.

2)b) VDECS Safety Exemption

- 1. Comment:** The Second Notice expands the provision for a VDECS exemption if using the equipment conflicts with occupational safety and health laws to include conflicts with mining safety and health requirements. Second Notice at 3; ORD Rule Section 2449(e)(8). The provision should make clear that the exemption applies if the use of the VDECS conflicts with any applicable law, including federal laws related to aviation. In addition, the ORD Rule should not require the use of any VDECS unit under circumstances that conflict with voluntary fire or other safety standards. While these changes would not rescue the ORD Rule or Section 2449(e)(8) from the preemption and other legal flaws noted in these and previous ATA comments, to the extent ARB elects to list conflicts with occupational and mining requirements as justifying an exemption for VDECS, the agency should recognize the potential for conflicts with other laws, as well as important voluntary safety standards. (ATA3)

Agency Response: ARB believes the provisions in the regulation are adequate to ensure that the regulation will not require the installation of any retrofit devices that would cause vehicle to operate unsafely (such as those that would conflict with fire or other safety standards). The regulation also contains an appeals process for fleet owners who do not receive a favorable Executive Officer decision on a safety-related exemption. Please refer to the response in section III-A-2)a)ii) of this FSOR for further discussion of the VDECS safety provisions in the regulation. The commenter's request for a general exemption for potential conflicts with any applicable law is difficult to address in the abstract, not knowing the laws, issues, or facts to which the commenter is referring. To the extent that specific issues and circumstances arise regarding use of VDECS, ARB believes that it has sufficient discretionary enforcement authority under the regulation to address the issues in a fair and reasonable manner. See Chapter 19 of this FSOR for a discussion of preemption and ARB's belief that the CAA and federal aviation laws need to be harmonized to the extent possible.

2)c) Lack of VDECS

- 1. Comment:** It was because of product availability, that the Construction Industry repeatedly requested more time for technology to catch up and to offer a good supply of verified products. As it stands now, there are only five Verified Diesel Emission control Systems (VDECS) that the industry has to improve emissions from existing equipment in their fleet. One of these filters is an active filter that operates without the use of an outside electrical source for regeneration. We have had significant problems with this particular device and want more OEM manufacturers to get on board. The Caterpillar filter, which has not been verified by CARB, is the only filter that is offered by an original equipment manufacturer and the only one that does not minimize operator comfort and visibility and overall

equipment safety. Our industry would like to see the Caterpillar filter verified sooner rather than later. This supports my earlier statement that CARB adopted a regulation biased on strong hopes rather than cost-effective technology-based VDECS would become reality and to find their way into the market place. (ECCO6)

Agency Response: The Caterpillar level 3 VDECS device has been conditionally verified by ARB. Please refer to <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm> for a listing of all VDECS that have been verified by ARB.

ARB shares the commenter's eagerness to see more VDECS become verified and increase the pool of vendors that fleet operators have to choose from. However, ARB staff believes that there are enough manufacturers currently to address fleet needs and that number will continue to grow. The response in section III-A-2(a)i) of this FSOR gives a more in-depth discussion of how we expect to see additional VDECS become available to fleet owners.

2)d) Severability Clause

1. **Comment:** ARB makes one significant change to the underlying ORD rule: the addition of a severability clause. Without a severability clause, ARB could not enforce any of its ORD rule until ARB receives a waiver of preemption from the U.S. Environmental Protection Agency. /See Pacific Merchant Shipping Assoc. v. Goldstene, F.3d, 2008 WL 509213 (9th Cir. 2008) ("PMSA")./ Having now added its severability clause, ARB may argue for the authority to enforce elements of the ORD rule that are not "standards," "other requirements," or "accompanying enforcement procedures" under Clean Air Act §209. Before ARB can enforce such non-preempted stand-alone elements of the ORD rule, however, the California Administrative Procedure Act ("APA") requires ARB to assess the need for and burden of such non-preempted stand-alone elements of the ORD rule. /See, e.g./, Cal.Gov't Code §11346.3(a). (AGCA5)

Agency Response: We disagree. While it is true that ARB added a severability clause in the second 15-Day Notice, it did so to make clear its intent that if a court or administrative body were to find that any part of the off-road regulation was unenforceable, other parts or sections of the regulation would not be affected. The commenter is wrong to infer that the severability clause was expressly included to address CAA § 209(e) authorization and enforcement questions. For those sections of the regulation that may be considered in-use operational controls (e.g., the five minute idling requirement), ARB has authority to enforce the provisions with or without authorization and with or without a severability clause. Nothing in Pacific Merchant Shipping Assoc. v. Goldstene, (9th Cir. 2008) F.3d , 2008 WL 509213, indicates to the contrary.

Finally, ARB has fully complied with the requirements of Government Code section 11346.3(a) in that it has fully assessed the potential for adverse economic impact on California business enterprises and individuals, avoiding the imposition of unnecessary or unreasonable regulations or reporting, recordkeeping, or compliance requirements. There is no requirement that in-use operational control provisions of the regulation must be assessed separate and apart from the regulation's emission standards, other requirements related to the control of emissions, or associated enforcement provisions.

D. Summary of Comments and Agency Responses – Third Notice of Modified Text

A table listing all commenters who submitted comments in response to the third notice is set forth below, identifying the date and form of all comments that were timely submitted. Following the table is a list of those comments that were not pertinent to the regulation, and a list of the comments that were wholly in support of the regulation.

Following those lists is a summary of each pertinent objection or recommendation, together with an agency response providing an explanation of how the proposed action has been changed to accommodate the objection or recommendation or the reasons for making no change. The comments have been grouped by topic whenever possible. Comments not pertinent to the modifications proposed in the third 15-Day Notice are not summarized below. Additionally, any other referenced documents are not summarized below.

Table III-D-1 below lists the comments received during the comment period for the third 15-day Notice.

Table III-d1 Comments from During the Comment Period for the Third 15-day Notice		
Reference Code	Commenter	Affiliation
CHAIN3	Chain, Steven	Chain, Steven
GERIC	G, Eric	private citizen
LANDSBURG	Landsburg, Ronald	Landsburg, Ronald
CAILLIER	Caillier, Kurt	Caillier, Kurt
ARTBA4	Goldstein, Nick	American Road and Transportation Builders Association
TEEBAY	Teebay, Richard	Teebay, Richard
NWS4	Thomas, James	Nabors Well Services Co

Table III--d1 Comments from During the Comment Period for the Third 15-day Notice		
Reference Code	Commenter	Affiliation
KRUEGER	krueger, john	krueger, john
CIAQC11	Lewis, Michael	Construction Industry Air Quality Coalition
AGCA8	Pilconis, Leah	AGC of America

The following Response Codes pertain to comments that were submitted in response to the third 15-day notice but were not pertinent to the third 15-day modifications:

Reference Code
CHAIN3
GERIC
LANDSBURG
CAILLIER
ARTBA4
TEEBAY
NWS4
KRUEGER

1. Comment 432 (CIAQC11)

- Comment:** The change to the regulation's language found in the Third Notice of Availability of Modified Text and Availability of Additional Documents for Section 2449.2(a)(2)(A)4.a through d. is characterized by staff as "clarified the wording" in the supporting material. This change however represents a significant change from the intent of the language present at the July 2007 Board Hearing and is done without justification or explanation, as described below.

The July language in this section addressing the condition for exemptions previously read:

"The following exemptions from the retrofit requirement apply, provided that retrofits have been or are being applied to all other engines in the owner's fleet not subject to these exemptions. A fleet is exempt from the retrofit requirement in 2449(d)(2)(B)1 if all its vehicles' engines meet one of the criteria below:

- Engines in vehicles less than 5 years old."

The exemption is now stated as follows:

"A vehicle is exempt from the retrofit requirements in section 2449.2(a)(2)(A)1 if all vehicles in the fleet that do not qualify for an exemption under the following conditions have been retrofitted, and the vehicle meets one of the following conditions:

- a. on the date of compliance, the vehicle is less than 5 years old from the vehicle's date of manufacture.

This change would now exclude from the exemption provided in the section vehicles older than 5 years old that were repowered with a higher tier, newer engine that is less than 5 years old. This is a significant change from the intent of the original regulation. A vehicle with an engine less than 5 years old (lower emission engine) will now be penalized for not being itself newer (age of frame for example) and held to a different standard than a new vehicle, with a new similar engine less than 5 years old. In this example the repowered vehicle and the new vehicle would have an identical engine, but only the new vehicle would receive the exemption. This penalizes the owner of the older vehicle that voluntarily repowered to a newer engine before the off-road regulation was created. (CIAQC11)

Agency Response: The commenter is incorrect; the exemption from retrofit has always been based on the vehicle age. As stated in the Third Notice of Availability of Modified Text and Availability of Additional Documents, this language change is for clarity and does not change the original intent.

At the July hearing, ARB staff said in the board presentation, "The regulation exempts certain vehicles from the retrofit requirements. It does not require retrofit of vehicles less than five years old." In the 2nd 15-day notice, we clarified that this was based on vehicle age, just in case there was any question. Here is an excerpt from the 2nd 15-day notice, which was released Feb. 5, 2008, p.4 - "Staff has also clarified that the exemption from the retrofit requirement for engines in vehicles less than 5 years old in section 2449.2(a)(2)(A)4.a. is based on the vehicle's date of manufacture."

In fact, it is clear that CIAQC understood the intended meaning. In the CIAQC11 comment, CIAQC contradicts its own earlier comment. In CIAQC's comment submitted on January 8, 2008 (ARB comment 385) in response to the first 15-day changes they state that the exemptions provisions could be stated more clearly as "Vehicle engines where the vehicle is less than five years old". In this comment submitted on March 20, 2008, they claim their interpretation of the language is different than it was on January 8, 2008.

2. Comment: The latest draft provided for the Third 15-day comment period also creates a distinction between emission reduction technologies where it should remain neutral. It does so by not treating all Tier 4 engines equally even though they meet the same emission standard. For example, some of the off-road vehicle manufacturers appear to have developed Interim Tier 4 engines utilizing particulate filters. Some do not. Both approaches achieve the same emission standards for particulate that is lower than the lowest particulate fleet average targets in the rule (for the 75-750 horsepower range).

When contractors replace or repower equipment with Tier 4 Interim engines that meet the standard with a particulate filter, they get credit on a horsepower-for-horsepower basis on both the NOX and particulate side of the rule. When they replace or repower equipment with Tier 4 Interim engines that meet the same standard without a particulate filter, they get credit on the NOx side, but not the particulate side.

Finally, beginning on March 1, 2021, contractors who have Tier 4 Interim engines in their fleets that meet the particulate standard without a particulate filter have to begin a process of installing VDECS on these engines, even though they meet the same standard as Tier 4 Interim engines that do not have a particulate filter (see (2449(d)(10)(B)). Removing this credit and requiring VDECS on Tier 4 Interim engines that meet the standards without the use of particulate filters indicates that CARB is projecting a bias for a certain technology instead of just advocating for emissions targets and allowing engine manufacturers figure out how best to achieve them. (CIAQC11)

Agency Response: The comment made by CIAQC11 above does not pertain to the Third 15-day modifications and falls outside of previous public comment periods for this regulation; therefore, these comments are not relevant.

The changes made in the Third 15-day modifications include:
Updated the definition of captive attainment fleet,
Added a provision to allow the Executive Officer to grant an extension when Tier 3 vehicles are not available,
Clarified previous language,

The clarification did not include any new or substantive changes. The new language pertained to a definition and ability of the Executive Officer to grant an exemption. The new language does not create a distinction between emission reduction technologies. Thus, the comments are not relevant.

2. Comment 433 (AGCA8)

1. **Comment:** ARB's Machinery Trader.com searches were over-inclusive because they include rental equipment, which would not necessarily be available for sale, and thus would not (except perhaps rental) help California fleets comply with the ORD rule. (AGCA8)

Agency Response: While conducting searches of Machinery Trader the box marked "Equipment for Sale" was checked and not the box "Equipment for Rent". Screenshots of all of the searches were saved and provided in the 3rd 15 day package. Staff observed that a piece of equipment might be listed under both "Equipment for Sale" and "Equipment for Rent"; however, as stated, staff only counted equipment for sale.

2. **Comment:** ARB's Machinery Trader.com searches were over-inclusive because they include equipment with less than 25 horsepower, which is exempt from the ORD rule. (AGCA8)
3. **Comment:** ARB's Machinery Trader.com searches were over-inclusive because they include equipment that is not self-propelled, which is exempt from the ORD rule. (AGCA8)
4. **Comment:** ARB's MachineryTrader.com searches are over-inclusive because they include non-diesel equipment which is not subject to the ORD rule, and more importantly, likely would not be an appropriate substitute for diesel-powered equipment in most construction contexts because of construction-specific issues such as the availability of fuel/power or the available torque/ performance. (AGCA8)
5. **Comment:** ARB's Machinery Trader.com searches were over-inclusive because they include units subject to ARB regulations as on road vehicles or portable equipment which are exempt from the ORD rule. (AGCA8)
6. **Comment:** All but two categories (Compaction- Landfill, and Wheel Dozer) include equipment under 175 horsepower. All but five categories (the foregoing two plus Crane-Rough Terrain, Pipelayer, and Scrap Processing-Demolition) included equipment under 100 HP. Nine categories included equipment under 25 HP. (AGCA8)

Agency Response: To be conservative, as described further below, when doing the Used Vehicle Analysis included in the 3rd 15-day package, we left out many categories of vehicles that we knew would contain some but not all vehicles covered by the regulation. As a result, there were several thousand pieces of equipment listed on Machinery Trader that would be subject to the regulation that ARB staff did not count. Staff is confident that these several thousand vehicles not counted will offset the few vehicles that inappropriately made it into the total counts (as noted by commenter AGCA8). In addition, while Machinery Trader is

the largest site for off-road equipment it is not the only site for ORD equipment purchase. There are several other thousand pieces of equipment that are listed on different sites (i.e. Ritchie Brothers') or sold at live auctions and therefore were not included in the equipment totals supplied in the supplemental data. Thus, staff is confident that the total numbers of used vehicles available included in the 3rd 15-day package is a valid estimate.

Due to the limitations of the data that were entered in the Machinery Trader website by the sellers, it was not possible to explicitly separate out equipment by horsepower since in most cases, the seller did not include the horsepower of the vehicles. However, the selection of equipment categories used in construction are those that would typically have horsepower higher than 25 horsepower engines (e.g., dozers, scrapers, etc.). Even in equipment categories where lower horsepower engines are used, the engines are almost always over 25 horsepower. For example, mini-excavators use lower horsepower engines but among the ten models currently offered by Bobcat, only one model has an engine less than 25 horsepower. Further, based upon prior auctions of used construction equipment, staff believe the sales volume of the models with the lowest horsepower is very low compared to more durable equipment with relatively higher horsepower. Staff is confident that the almost all of equipment returned in the results were over 25 horsepower.

Staff believes that the equipment categories included in the results limit the vehicles selected to those that are virtually always self-propelled. As such, these vehicles would be subject to this regulation and not the portable equipment regulation.

The vast majority of equipment selected was powered by diesel-fueled engines. Staff did include in the final results scissor lifts which utilize not only diesel fueled engines but also electric motors. Regardless, the remaining categories utilize diesel-fueled engines in the vast majority of cases.

Further, staff was aware that a relative few pieces of equipment that were not subject to the rule would be included in the total number of vehicles counts. This is why we only used one auction site and did not include several categories on Machinery Trader's site. Those categories not included are asphalt, paving and concrete equipment, all terrain, tower and hydraulic cranes, forestry equipment, scrapers, sweepers and broom equipment, trencher and boring equipment, water equipment and all equipment listed under the "other" category. As a result, there were several thousand pieces of equipment listed on Machinery Trader that would be subject to the off-road regulation that ARB staff did not count. Staff is confident that these several thousand pieces of equipment not counted will offset the few pieces of equipment that inappropriately made it into the total counts. In addition, while everyone is in agreement that Machinery Trader is the largest site for off-road equipment it is not the only site for off-road equipment purchase. There are several other thousand pieces of equipment that are listed on different

sites (i.e. Ritchie Brothers') or sold at live auctions and therefore were not included in the equipment totals supplied in the supplemental data. In conclusion, staff is confident that staff's analysis gives a valid estimate of the actual number of used vehicles available for purchase.

7. **Comment:** To the extent that ARB relies on the worldwide totals not the U.S. totals, ARB's MachineryTrader.com searches are over-inclusive because they include "Grey market" foreign equipment not certified to federal or California standards, which would not help California fleets comply with the ORD rule. (AGCA8)

Agency Response: Staff included U.S. only data in the analysis in the 3rd 15-day package. The number of 2003 or newer equipment located in the U.S. was very similar to the worldwide totals stated in the TSD.

8. **Comment:** ARB's MachineryTrader.com search results are truncated to a single "screenshot" of each search, which does not include all of the units on that search page, much less all of the search pages generated for each search. Aside from the few units that appear on these screenshots, the reader cannot tell whether the equipment identified in the search actually is relevant or instead should have been excluded for one of the foregoing reasons (or some other reason that might be apparent if ARB had included the results of its screenshots). (AGCA8)

Agency Response: With more than 72,000 pieces of equipment/vehicles, the task of printing out each of those pages was beyond available resources. The top pages provide the subtotals upon which the results of the analysis were based and allow the reader to reproduce the totals included in the 3rd 15-day package. The MachineryTrader's website is set up to return search results with 25 listings per page. Rather than print thousands of pages, staff instead scanned the results removing categories that contained a large number of equipment pieces not applicable to the off-road regulation and included categories that had a vast majority of equipment covered by the off-road regulation. As described above, ARB intentionally excluded several thousand pieces of equipment that we knew will be subject to the regulation in order to offset the equipment that will be inadvertently counted but not subject to it.

9. **Comment:** Because the MachineryTrader.com equipment categories are very broad, ARB's summary data do not distinguish between low-cost small units (e.g., under 175 HP) that industry would turn over regularly even without an ORD rule and the higher-cost, higher -HP large units that industry needs to complete large construction projects. For example, the Crawler dozer and Crawler Excavator categories include equipment ranging from small Bobcat units available for rent for do-it-yourselfers to large Caterpillar D11 bulldozers. The small-equipment categories are significantly more available, both as a share of the total market in used

equipment and with higher degree of availability in later model years. (AGCA8)

Agency Response: We agree that higher horsepower equipment such as scrapers and dozers will likely be less available than lower horsepower equipment. However, because of the high initial cost and long useful life, these vehicles are the most cost-effective candidates for repowering. Therefore, fleet owners with these types of vehicles have more options to comply with the regulation than just replacement.

Further, although we believe in general there will be sufficient used vehicles available for fleets to purchase to comply with the regulation, the regulation contains provisions that protect a fleet from penalty if it is unable to find a used vehicle to meet its needs. In concluding, in ARB's used vehicle analysis, that there were sufficient used vehicles, staff did not mean to guarantee there would be a perfect vehicle available for every fleet's potential needs. We acknowledge situations will arise where fleets cannot find a used vehicle to meet their needs. However, if a fleet is unable to locate a replacement or repower for a current vehicle that particular piece of equipment can be considered "specialty vehicle," which is exempt from the mandatory turnover requirements.

As stated before, the ARB's used vehicle search did not include rental equipment.

10. Comment: On March 19, 2008, in my capacity as an attorney for AGC and CIAQC, I visited the website of the California Office of Planning and Research (OPR) and queried the database of CEQA documents filed by ARB from January 2007 to that time. My search and results indicate that ARB has not filed its ORD rulemaking documents with OPR. (AGCA8)



OPR Home > CEQAnet Home > CEQAnet Query > Search Results

Click Project Title link to display all related documents. Document Type link will display full document description.

Records Found: 2

[First] [Next] [Previous] [Last]

Page: 1

Query Parameters: All None All

Date Range: 2007-01-01 to 2008-03-31

SCH#	Lead Agency	Project Title	Description	Document Type	Date Received
2007082087	Air Resources Board	Proposed State Strategy for California's 2007 State Implementation Plan	Notice of Public Meeting to Consider Approval of the Proposed State Strategy for California's State Implementation Plan (SIP) for the Federal 8-Hour Ozone and PM2.5 Standards.	Oth	8/14/2007
2007081077	Air Resources Board	Modification to the Current SIP Commitment for Pesticide Emission Reductions in the Ventura County Nonattainment Area	Revised Proposed Revision and Revised Environmental Analysis to the Pesticide Element of the 1994 Ozone SIP for the Ventura County Nonattainment Area.	Oth	8/13/2007

Agency Response: ARB will be filing a Notice of Decision and Response to Significant Environmental Issues with the Secretary of the Resources Agency, upon final adoption of the regulation.

11. Comment: The length of the comment period on ARB's third "15-day notice" has prejudiced AGC's and CIAQC's ability to review the relevant data and to prepare comments and supporting affidavits. In particular, the following issues prejudiced our ability to respond within the time provided: (1) the construction industry had its annual convention during the week of March 10, and many key players were unavailable for most of that week; (2) prior to the convention week, we devoted significant attention to meeting the March 6, 2008, comment deadline for ARB's prior 15-day comment period, and thus did not have a significant amount of the time to devote to the new notice that came out on March 5, 2008; (3) my schedule included an appellate oral argument and a district-court dispositive motion, both on March 18, 2008; (4) several key members of our legal team had illnesses in their family during the notice period. (AGCA8)

Agency Response: We disagree. Government Code section 11346.8(c) provides that an agency shall provide the public with at least 15 days to submit responses to the proposed regulatory language changes. While ARB provided more than 15 days on the first two 15-Day Notice packages because of the number of changes included in each, the third 15-Day package included relatively minor changes. ARB typically provides 15 days for public comment. ARB staff cannot anticipate that particular individuals would be at conferences, have prior work obligations, or encounter family illnesses that would prevent the timely submittal of comments.