State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resource
86-1	UCD - $23,885 - Data Anal./Sacto Valley	RD	1/24/86	1/23/86	N/A
86-2	UCR - $98.003 - Photo. Mech./Air Model.	RD	1/24/86	1/23/86	N/A
86-3	Invit./Bid "Base Map/Emerald Lk Wtrshd Chickering-Green Empire, Inc.	RD	1/24/86	1/23/86	N/A
86-4	Placer County Boundary Change	TSD	1/24/86	1/23/86	8/27/86
86-5	Ident. of Hexavalent Chromium as a TAC	SSC	1/24/86	1/24/86	8/27/86
86-6	Dr. Smuckler Farewell Resolution	RD	1/24/86	1/23/86	N/A
86-7	EMSI - $232,581 - Effects of Acid Deposition on Materials	RD	2/28/86	2/28/86	N/A
86-8	USC - $249,603 - Invest./Effects of Acidic Fog & Dew Upon Materials	RD	2/28/86	2/28/86	N/A
86-9	UCSB - $147,140 - Watershed Study: Biota in the Emerald Lake System (Seq. Natl Pk) & Stream Channel Experiments	RD	2/28/86	2/28/86	N/A
86-10	SAI - $74,474 - Inventory/Chlorophenol Use/Forest Prod. Ind./Dibenzodiox/furans	RD	2/28/86	2/28/86	N/A
86-11	UCD - $31,656 - Volatile & Poten. Toxic Organic Compounds/Sewage Trtmnt Plants & Collection Systems	RD	2/28/86	2/28/86	N/A
86-12	NIPER - $249,892 - Fate of Benzene Precursors in Gasoline	RD	2/28/86	2/28/86	N/A
86-13	UCI - $302,651 - Inhalation Toxicology of Comb. Acid and Soot Particles	RD	2/28/86	2/28/86	N/A
86-14	UCI - $188,207 - Genotoxicity of Diesel Exhaust Part. & Vapors Coll./Engines w/and w/o Part. Trap Oxidizers	RD	2/28/86	2/28/86	N/A
86-15	UCD- $124,249 - Development of Test Procedures to Determine Emissions from Open Burning of Ag and Forestry Wastes"	RD	2/28/86		N/A
86-16	UCD - $119,023 - Retention & Metabolism of Toxics...Xenobiotic Vapors by People	RD	3/27/86	3/27/86	N/A

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-17	UCD - $43,353 - Effects of Ozone on Cellular Syn/Viral Repl. In Vitro	RD	3/27/86	3/27/86	N/A
86-18	UCLA - $117,417 - Carbonaceous Aerosols and Gases	RD	3/27/86	3/27/86	N/A
86-19	UCR - $37,654 - Meas. of Carbonaceous Aerosol Species	RD	3/27/86	3/27/86	N/A
86-20	EMSI - $25,938 - Intercomp./Methods/ Measure./Carbonaceous Aerosol Species	RD	3/27/86	3/27/86	N/A
86-21	Oregon Grad. Center - $49,446 - Sampling & Analysis of Organic Aerosol	RD	3/27/86	3/27/86	N/A
86-22	UCR - $59,714 - Effects of Ozone on Primary Determinants of Plant Product.	RD	3/27/86	3/27/86	N/A
86-23	UCD - $51,546 - Time Series Analysis of Mortality/Assoc. Weather/Poll. Effects L. A. Co.	RD	3/27/86	3/27/86	N/A
86-24	Radian Corp. - $74, 999 - Eval/Emissions from Selected Uninventoried Sources	RD	3/27/86	3/27/86	N/A
86-25	Identification of Asbestos as a TAC	SSD	3/28/86	3/28/86	8/27/86
86-26	Long-Range Research Plan	RD	3/27/86	3/27/86	N/A
86-27	Daniel Grosjean and Assoc-$79,150-" Measurement of Organic Acids in the SCAB"	RD	4/25/86	4/25/86	N/A
86-28	CA. Dept. of Fish and Game-$102,778 - "Statewide Survey of Aquatic Ecosytem Chemistry"	RD	4/25/86	4/25/86	N/A
86-29	UCSF-$603,733-"Effects of Acid Fog and Airway Function in People with Asthma"	RD	4/25/86	4/25/86	N/A
86-30	CIT-$87,839-"Acquisition of Acid Vapor and Aerosol Concentration Data for Use in Dry Deposition Studies in the SCAB"	RD	4/25/86	4/25/86	N/A
86-31	U.S. Geological Survey-"Analysis of Trace Metals in the Emerald Lake Watershed" $8,892	RD	4/25/86	4/25/86	N/A
86-32	American Research and Testing-"A Study of $28,435) the Efficacy of Aerosol vs. non-Aerosol Laundry Products"	RD	4/25/86	4/25/86	N/A

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-33	Sonoma Tech, Inc.-$247,137-"Southern CA. Air Quality Study - Program Mgt."	RD	4/25/86	4/25/85	N/A
86-34	American Research and Testing-$99,026-"A Study of Application Rates of Aerosol and Pump Hair Sprays"	RD	4/25/85	4/25/86	N/A
86-35	SW Research Institute-$249,954-"Characterization of Exhaust Emissions from Trap-Equipped Light-Duty Diesels"	RD	4/25/86	4/25/86	N/A
86-36	UCI-$76,620-"Interaction of Humidity with Air Pollutants on Vegetation"	RD	4/25/86	4/25/86	N/A
86-37	UCD-$157,268-"The Role of Ozone Induced Lung Imflammation in Humans Varing Widely in Pulmonary Function Response"	RD	4/25/86	4/25/86	N/A
86-38	USC-$112,940-"Nitrogen Dioxide Effects on Progression of Mouse Lymphoma/Leukemia, A Blood Cell Malignancy"	RD	4/25/86	4/25/86	N/A
86-39	CA Arboretum Found.-$62,934-"A Demonstration of the Effects of Smog on Ornamental and Home Garden Plants"	RD	4/25/86	4/25/86	N/A
86-40	UCSF-$113,784-"Air Pollutant Effects on Nasal Function"	RD	4/25/86	4/25/86	N/A
86-41	FAREWELL RESOLUTION FOR STANLEY P. AZEN, PH.D., SRP MEMBER	Legal	4/25/85	4/24/86	N/A
86-42	FAREWELL RESOLUTION FOR TIRSO DEL JUNCO, MD ARB MEMBER	Legal	4/25/86	4/24/86	N/A
86-43	.4 Nox Standard for Motor Vehicles	MSD	4/24/86	4/25/86	8/27/86
86-44	Heavy Duty Gasoline Vehicles	MSD	4/25/86	4/25/86	8/27/86
86-45	Heavy Duty Diesel Vehicles	MSD	4/25/86	4/25/86	8/27/86
86-46	UCD-$58,127-"Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, CA"	RD	5/22/86	5/22/86	N/A
86-47	Research Triangle Inst.-$200,000-$Comparison of Indoor and Outdoor Toxic Air Pollutant Levels in Several S.CA Communities"	RD	4/25/8	4/25/86	N/A
86-48	Valley Research Corp.-$74,955-$Development of Procedures for Establishing the Uncertainties of Emission Estimates"	RD	5/22/86	5/22/86	N/A

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-49	UCR-$193,552-"A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons" at Various Locations in CA	RD	5/22/86	5/22/86	N/A
86-50	Combustion Engineering Inc.-$385,364 "S.CA Air Quality Study"	RD	5/22/86	5/22/86	N/A
86-51	Sonoma Tech.-$53,707-"Southern CA Air Quality Study"	RD	5/22/86	5/22/86	N/A
86-52	Sierra Research-$199,937-"A Study of Excess Motor Vehicle Emissions-Causes and Control"	RD	5/22/86	5/22/86	N/A
86-53	Unisearch Assoc.-$23,332-"Part. in Carb. Species Methods Comp. Study- Tunable Diode Laser Absorption Spectrometer Measurements"	RD	5/22/86	5/22/86	N/A
86-54	UCI-$199,166-"Coordinated Multidisiplinary Research Program on CO Health Effects"	RD	5/22/86	5/22/86	N/A
86-55	CalCoast Analytical Labs-$74,850-"Testing of Low-Solvent Air-Dried Coatings for Misc. Metal Parts and Coatings"	RD	5/22/86	5/22/86	N/A
86-56	Methanol Task Force Report - Board Approval	MSD	5/22/86	5/22/86	N/A
86-57	AeroVironment, Inc.-$540,500-"So. Cal. Air Quality Study"	RD	5/22/86	5/22/86	N/A
86-58	UCR-$265,206-"Integ. Soil Processes Studies at Emerald Lake Watershed	RD	6/19/86	6/19/86	N/A
86-59	UCSB-$237,658-"Char. of Year-Round Sensitivity of Calif. Mtn. Lakes to Acidic Deposition	RD	6/19/86	6/19/86	N/A
86-60	Refinery Flares	SSD	6/19/86		N/A
86-61	Consideration of Proposed Benzene Control Plan	SSD	6/19/86		N/A
86-62	Dr. Mrak Farewell resolution		6/19/86		N/A
86-63	Carnegie-Mellon-$149,965-"A Quant.Assess. of Air Quality Effects of Methanol Fuel Use	RD	6/19/86	6/19/86	N/A
86-64	ERC $88,895 Economic Impact on Forests	RD	7/24/86	7/24/86	N/A

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-65	EEA $39,830 Truck Inventory	RD	7/24/86	Withdrawn at Board meeting	N/A
86-66	UCD $76,374 Toxic Airborne Effluents	RD	7/24/86	7/24/86	N/A
86-67	UCR $97,954 Crop Loss Assessment	RD	7/24/86	7/24/86	N/A
86-68	Cert. Test Procedures - Vehicles	MSD	7/24/86	7/24/86	1/13/88
86-69	Benzene	SSD	7/24/86	7/24/86	N/A
86-70	Acid Deposition Fee Schedule	RD	7/24/86	7/24/86	1/13/88
86-71	Dioxins/Dibenzofurans as TAC's	SSD	7/25/86 8/21/86	8/21/86	1/13/88
86-72	Sierra Research $29,638 1982 Truck Inv.	RD	8/21/86	8/21/86	N/A
86-73	Radian $19,600 Heavy Duty Diesel	RD	8/21/86	8/21/86	N/A
86-74	UCR $86,978 Effects of SO_2 on Trees	RD	8/21/86	8/21/86	N/A
86-75	UCR $30,797 Field Fumigation Facility	RD	8/21/86	8/21/86	N/A
86-76	Kern County SIP	TSD	8/21/86	8/21/86	9/16/86
86-77					
86-78	see next book				
86-79					
86-80					

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-77	DRI - $1.4 million	RD	9/25/86	9/25/86	N/A
86-78	AeroVironment -So. Cal. Air Quality $198,216	RD	9/25/86	9/25/86	N/A
86-79	US Forest Service - Snow $113,000	RD	9/25/86	9/25/86	N/A
86-80	VRC - Inventory of Materials $248,624	RD	9/25/86	9/25/86	N/A
86-81	Humboldt State - Conf. Acid Dep. $35,000	RD	9/25/86	9/25/86	N/A
86-82	UCLA - Veg. Process Studies $219,398	RD	9/25/86	9/25/86	N/A
86-83	Leonard Myrup - Sequoia $8,000	RD	9/25/86	9/25/86	N/A
86-84	UCB - Sediments Study $46,591	RD	9/25/86	9/25/86	N/A
86-85	EDB	RD	9/25/86	9/25/86	
86-86	Visibility	SSD	9/25/86	9/25/86	
86-87	RTI - Chromium $168,511	RD	10/23/86	10/23/86	N/A
86-88	Sonoma Tech. SCAQS Aircraft $275,000	RD	10/23/86	10/23/86	N/A
86-89	Tech.&Bus. Systems SCAQS Meteorology $329,148	RD	10/23/86	10/23/86	N/A
86-90	AeroVironment -Instrum & equip. borrowed $48,409	RD	10/23/86	10/23/86	N/A
86-91	Sonoma Tech. - Instrum & equip. Purchased $44,800	RD	10/23/86	10/23/86	N/A
86-92	Daniel Grosjean - PAN measurements $34,302	RD	10/23/86	10/23/86	N/A

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-93	ERT- Dioxins Study $167,577	RD	10/23/86	10/23/86	N/A
86-94	AB 965 Regs	MSD	11/20/86	11/20/86	1/13/88
86-95	Not Used				
86-96	Not Used				
86-97	Not Used				
86-98	Ag Burning Regs	ADD	11/20/86	11/20/86	1/13/88
86-99	Test Methods Nonvehicular Sources	SSD	11/20/86	11/20/86	1/13/88
86-100	Gordon Kennedy's Farewell Resolution	Legal	11/20/86		N/A
86-101	Cal PH Found. Acidic Aeorosol $164,044	RD	11/20/86	11/20/86	N/A
86-102	UCSB Snow Deposition $32,183	RD	11/20/86	11/20/86	N/A
86-103	UCR Acid Fog $88,480	RD	11/20/86	11/20/86	N/A
86-104	WOGA Petition	Legal	11/20/86	11/20/86	N/A
86-105	Ozone UCR $66,202	RD	12/18/86		N/A
86-106	S.J.V Crops UCR $75,871	RD	12/18/86		N/A
86-107	UCD S.J.V. Pollutants $39,416	RD	12/18/86		N/A
86-108	UCI Lungs $65,427	RD	12/18/86		N/A

State of California
AIR RESOURCES BOARD

RESOLUTIONS

No.	Item	Staff	Hearing Scheduled	Date Adopted	+ EIS to Resources
86-109	UCI PM_{10} $53,509	RD	12/18/86		N/A
86-110	Loma Linda AHSMOG Follow-Up $254,795	RD	12/18/86		N/A
86-111	Biospherics Hydrocarbon $140,000	RD	12/18/86		N/A
86-112	ERT SCAQS - Quality Assurance $63,085	RD	12/18/86		N/A
86-113	RT Indoor Air Pollution $12,080	RD	12/18/86		N/A
86-114	Lawrence Lab Carb. Aerosol Symposium $5,000	RD	12/18/86		N/A
86-115	Grey Market	MSD	12/18/86	12/18/86	1/13/88
86-116	Landfill Guidelines	SSD	12/18/86	12/18/86	N/A

State of California
AIR RESOURCES BOARD

Resolution 86-1
January 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1341-120, entitled "An Analysis of the Sacramento Valley Experiment," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1341-120, entitled "An Analysis of the Sacramento Valley Experiment," submitted by the University of California, Davis, for a total amount not to exceed $23,885.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1341-120, entitled "Analysis of the Sacramento Valley Experiment," submitted by the University of California, Davis, for a total amount not to exceed $23,885.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $23,885, of which $6,885 is to be provided from State funds and $17,000 is to be provided from funds awarded for this purpose by the United States Environmental Protection Agency.

I hereby certify that the above is a true and correct copy of Resolution 86-1 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.:
DATE: January 24, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal Number 1341-120 entitled "An Analysis of the Sacramento Valley Experiment."

RECOMMENDATION: Adopt Resolution 86-1 approving Proposal Number 1341-120 for funding in an amount not to exceed $23,885.

SUMMARY: The objective of the original study was to determine the sources of pollutants which contribute to visibility degradation and high aerosol concentrations. Possible sources include the Sacramento urban area, agricultural burning, and transport of pollutants from the San Francisco Bay Area.

The purpose of this proposal is to analyze further the aerometric, emissions and meteorological data collected during the intensive period of air monitoring in October 1984 in the Sacramento Valley and Delta areas.

The original field study, conducted in response to requests from Sacramento Valley Air districts, was carried out by NASA, EPA, U. C. Davis and ARB researchers. The NASA facility at Sunnyvale contributed an airborne laboratory that provided aerometric measurements aloft at no cost to ARB. EPA's Environmental Monitoring Systems Laboratory provided, also at no cost to ARB, a LIDAR-equipped aircraft that made aerosol observations throughout the project area. Researchers from U. C. Davis collected aerosol samples which have been analyzed for chemical composition. A team from U. C. Davis and ARB collected detailed surface and winds-aloft data throughout the study area. Detailed data for emissions from agricultural burning have been made available for this period by local air districts.

This additional analysis is intended to provide a quantitative description of the major sources of aerosol in the Sacramento Valley during a period of generally elevated aerosol concentrations. This information will be used by the Board's staff and others to develop air quality management strategies for PM_{10} and related pollutants. The analysis phase proposed here would be funded partly by the U.S. EPA ($17,000) and partly by ARB ($6885).

State of California
AIR RESOURCES BOARD

Resolution 86-2
January 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1352-121, entitled "Development and Implementation of an Up-to-Date Photochemical Mechanism for Use in Airshed Modeling," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1352-121, entitled "Development and Implementation of an Up-to-Date Photochemical Mechanism for Use in Airshed Modeling," submitted by the University of California, Riverside, for a total amount not to exceed $98,003.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1352-121, entitled "Development and Implementation of an Up-to-Date Photochemical Mechanism for Use in Airshed Modeling," submitted by the University of California, Riverside, for a total amount not to exceed $98,003.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $98,003.

I hereby certify that the above is a true and correct copy of Resolution 86-2 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NUMBER:
DATE: January 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal Number 1352-121 entitled "Development and Implementation of an Up-to-Date Photochemical Mechanism for Use in Airshed Modeling."

RECOMMENDATION: Adopt Resolution 86-2 approving Proposal Number 1352-121 for funding in an amount not to exceed $98,003.

SUMMARY:

There is an immediate need to update the chemical mechanisms used in the airshed models that the ARB staff are currently using for control strategy assessments. In addition, ARB needs to make future updates to the chemical mechanisms in these models to incorporate new kinetic and mechanistic data.

This one-year project would: 1) update the photochemical mechanism now used by the Board to produce an improved representation of smog chemistry; 2) condense and adapt this detailed mechanism so it can be employed in airshed model calculations with as much chemical fidelity as possible, given the constraints of computer time and memory; 3) modify the portions of the airshed model software used to implement the chemical mechanism so that future changes to the chemical mechanism can be more readily implemented; and 4) review and critically evaluate the atmospheric chemistry of the various classes of emitted organic compounds that are of concern to the Board.

The Research Screening Committee has recommended that this contract be awarded to the University of California, Riverside. The principal investigator will be Dr. William Carter.

BUDGET SUMMARY

University of California, Riverside

"Development and Implementation of an Up-to-Date Photochemical Mechanism for Use in Airshed Modeling"

BUDGET ITEMS:

Salaries	$48,115	
Benefits	11,652	
Supplies	7,000	
Other Costs	1,580	
Travel	1,200	
TOTAL, Direct Costs		$69,547
TOTAL, Indirect Costs		28,456
TOTAL PROJECT COST		$98,003

State of California
AIR RESOURCES BOARD

Resolution 86-3
January 23, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an Invitation for Bid entitled "Base Map for Emerald Lake Watershed", has been submitted by Chickering-Green Empire, Inc.;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Invitation for Bid entitled "Base Map for Emerald Lake Watershed", submitted by Chickering-Green Empire, Inc. for a total amount not to exceed $6,615.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Invitation for Bid entitled "Base Map for Emerald Lake Watershed," submitted by Chickering-Green Empire, Inc. for a total amount not to exceed $6,615.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $6,615.

I hereby certify that the above is a true and correct copy of Resolution 86-3 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NUMBER:
DATE: January 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Invitation for Bid entitled "Base Map for Emerald Lake Watershed".

RECOMMENDATION: Adopt Resolution 86-3 approving an Invitation for Bid for funding in an amount not to exceed $6,615.

The contractor will produce three map products from aerial photographs of the Emerald Lake Watershed. The products are an ortho-photo map, contour map and a digital elevation grid.

SUMMARY: One of the objectives of the Integrated Watershed Study in the Emerald Lake basin of Sequoia National Park is to estimate the total loading of acid deposition to the watershed. Approximately 80 percent of the precipitation in the basin is in the form of snow which is a path for acid deposition to the basin. It is important to accurately estimate snow loading and snow melt in the basin if estimates of total acid deposition to the basin are to be meaningful. The map products produced by the contractor will enable the Board to make more accurate estimates of snow loading and snow melt in the Emerald Lake Watershed. In addition, the detailed maps will be used to precisely locate equipment and sampling sites.

The recommended contractor is Chickering-Green Empire, Inc.

State of California
AIR RESOURCES BOARD

Resolution 86-4

January 23, 1986

Agenda Item No.: 86-1-2

WHEREAS, Section 39606 of the Health and Safety Code directs the Air Resources Board (the "Board") to divide the state into air basins based on meteorological and geographic conditions and with consideration for political boundary lines whenever practicable;

WHEREAS, Placer County is currently divided into two air basins, the Mountain Counties Air Basin and the Lake Tahoe Air Basin;

WHEREAS, on August 7, 1985, a resolution from the Placer County Air Pollution Control Board was submitted requesting that the Board change the boundary between the Mountain Counties and Sacramento Valley Air Basins so that the western portion of Placer County is in the Sacramento Valley Air Basin, rather than the Mountain Counties Air Basin;

WHEREAS, with the proposed change the eastern portion of Placer County will remain in the Lake Tahoe Air Basin, the central portion will remain in the Mountain Counties Air Basin, and the western portion will be in the Sacramento Valley Air Basin;

WHEREAS, staff recommends that the boundary change be effective July 1, 1986, in order to avoid disrupting the state subvention program in the middle of the fiscal year;

WHEREAS, the District's Air Pollution Control Officer, in a November 27, 1985 letter, stated that he would present to his board for adoption rules and regulations for the proposed Sacramento Valley Air Basin portion of the District to be effective July 1, 1986;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held to consider the Placer County Air Pollution Control Board's request in accordance with provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

Current meteorological data indicates that the proposed boundary between the Mountain Counties Air Basin and the Sacramento Valley Air Basin is a more accurate physical demarcation than the existing boundary; and

The intent of the law would be served if the boundary between the Mountain Counties Air Basin and the Sacramento Valley Air Basin were changed as requested; and

WHEREAS, the Board has determined pursuant to the requirements of the California Environmental Quality Act and Board regulations that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE, BE IT RESOLVED that effective July 1, 1986, Sections 60106 and 60111 of Title 17, California Administrative Code, are amended as set forth in Attachment A hereto.

BE IT FURTHER RESOLVED that the Executive Officer shall follow the progress of Placer County's promulgation of rules for the Sacramento Valley Air Basin portion of Placer County and the Executive Officer shall report back to the Board, prior to the effective date of this action, if the Executive Officer determines that the District's proposed rules for the Sacramento Valley Air Basin portion are inadequate to protect the air quality in the area.

I hereby certify that the above is a true and correct copy of Resolution 86-4, as adopted by the Air Resources Board

Harold Holmes, Board Secretary

Attachment A

Sections 60106 and 60111 of Title 17 of the California Administrative Code shall be amended to read as follows (crossed-out words have been deleted, underlined words are additions):

Article 1. Description of California Air Basins

60106. Sacramento Valley Basin

(a) All of Tehama County

(b) All of Glenn County

(c) All of Butte County

(d) All of Colusa County

(e) All of Yolo County

(f) All of Sutter County

(g) All of Yuba County

(h) All of Sacramento County

(i) All of Shasta County

(j) That portion of Solano County which lies north and east of a line described as follows:

Beginning at the intersection of the westerly boundary of Solano County and the 1/4 section line running east and west through the center of Section 34, T6N, R2W, M.D.B. & M., thence east along said 1/4 section line to the east boundary of Section 36, T6N, R2W, thence south 1/2 mile and east 2.0 miles, more or less, along the west and south boundary of Los Putos Rancho to the northwest corner of Section 4, T5N, R1W, thence east along a line common to T5N and T6N to

the northeast corner of Section 3, T5N, R1E, thence south along section lines to the southeast corner of Section 10, T3N, R1E, thence east along section lines to the south 1/4 corner of Section 8 T3N, R2E, thence east to the boundary between Solano and Sacramento Counties.

(k) That portion of Placer County which lies west of Range 9 east, M.D.B. & M.

60111. Mountain Counties Air Basin

(a) All of Plumas County

(b) All of Sierra County

(c) All of Nevada County

(d) All of Amador County

(e) All of Calaveras County

(f) All of Tuolumne County

(g) All of Mariposa County

(h) All of El Dorado County except that portion included in the Lake Tahoe Air Basin, as defined in Section 60113(a).

(i) All of Placer County except that portion included in the Lake Tahoe Air Basin, as defined in Section 60113(b), and that portion included in the Sacramento Valley Air Basin, as defined in Section 60106(k).

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Amendments to Regulations Changing the Boundary Between the Mountain Counties Air Basin and the Sacramento Valley Air Basin

Agenda Item No.: 86-1-2

Public Hearing Date: January 23, 1986

Response Date: January 23, 1986

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: Harold Holmes
Board Secretary

Date: 1-29-86

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date :August 27, 1986

Subject: Filing of Notice of Decisions of the Air Resources Board

From Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-77
85-78
85-80
86-4
86-25
86-43
86-44
86-45

State of California
AIR RESOURCES BOARD

Resolution 86-5

January 24, 1986

Agenda Item No.: 86-1-3

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to do such acts and to adopt such regulations as may be necessary for the proper execution of the powers and duties granted to, and imposed upon, the Board by law;

WHEREAS, Chapter 3.5 (commencing with Section 39650) of Part 2 of Division 26 of the Health and Safety Code establishes procedures for the identification of toxic air contaminants by the Board;

WHEREAS, Section 39655 of the Health and Safety Code defines a "toxic air contaminant" as an air pollutant which may cause or contribute to an increase mortality or an increase in serious illness, or which may pose a present or potential hazard to human health;

WHEREAS, Section 39662 of the Health and Safety Code directs the Board to list, by regulation, substances determined to be toxic air contaminants, and to specify for each substance listed a threshold exposure level, if any, below which no significant adverse health effects are anticipated;

WHEREAS, hexavalent chromium is emitted from certain industrial processes such as chromium plating operations and hexavalent chromium treated cooling towers, and has been measured in the atmosphere;

WHEREAS, pursuant to the request of the Board, the Department of Health Services (DHS) evaluated the health effects of chromium in accordance with Section 39660 of the Health and Safety Code;

WHEREAS, DHS concluded in its evaluation that hexavalent chromium is an animal and potential human carcinogen and insufficient evidence exists to decide whether trivalent chromium is a potential human carcinogen; hexavalent chromium should be treated as a substance without a carcinogenic threshold; health effects other than cancer are not expected to occur at existing ambient levels with the possible exception of adverse reproductive effects, where the experimental data are inadequate to assess potential human reproductive effects; and the maximum excess lifetime cancer risk from hexavalent chromium exposure is estimated to range from 12 to 146 cases per million people exposed per nanogram per cubic meter;

WHEREAS, for the reasons set forth in its evaluation, DHS has concluded that, in the absence of strong positive evidence that carcinogenic substances act only through mechanisms which ought to have a threshold, these substances should be treated as acting without a threshold, and DHS has determined that no positive evidence of a carcinogenic threshold exists with respect to hexalavent chromium;

WHEREAS, upon receipt of the DHS evaluation, staff of the Board prepared a report including and in consideration of the DHS evaluation and recommendations and in the form required by Section 39661 of the Health and Safety Code and, in accordance with the provisions of that section, made the report available to the public and submitted it for review to the Scientific Review Panel (SRP) established pursuant to Section 39670 of the Health and Safety Code;

WHEREAS, in accordance with Section 39661 of the Health and Safety Code, the SRP reviewed the staff report, including the scientific procedures and methods used to support the data in the report, the data itself, and the conclusions and assessments on which the report was based, considered the public comments received regarding the report, and, on November 21, 1985 submitted its written findings to the Board;

WHEREAS, the SRP found to be prudent interpretations of the available evidence the propositions that:

> In epidemiologic studies where the oxidation state of chromium was unknown, chromium, either in the hexavalent (Cr(VI)) or trivalent (Cr(III)) state or both, was shown to be a human carcinogen.
>
> In other studies conducted in laboratory animals, chromium in the hexavalent state Cr(VI) was shown to be carcinogenic. Accordingly, hexavalent chromium Cr(VI) should be considered a potential carcinogen in humans.
>
> An exposure level below which no significant adverse health effects are anticipated could not be identified. Based on our knowledge of pharmacokinetics, metabolism and mode of action of chemical carcinogens like chromium, there is no scientific basis for determining an exposure level below which carcinogenic effects would not have some probability of occurring.
>
> Adverse health effects other than cancer are not anticipated at current ambient chromium exposure levels.

WHEREAS, the SRP found the staff report to be without serious deficiency, and included in its findings the statement that it agreed that hexavalent chromium should be listed by the Air Resources Board as a toxic air contaminant, but was unable to recommend an exposure level below which carcinogenic effects would not have some probability of occurring;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, in consideration of the staff report, including DHS' evaluation and recommendations, the available evidence, the findings of the SRP, and the written comments and public testimony it has received, the Board finds that:

Hexavalent chromium is an animal carcinogen and should be considered a potential human carcinogen;

Health effects other than cancer are not anticipated at current ambient hexavalent chromium exposure levels;

There is not sufficient available scientific evidence to support the identification of a threshold exposure level for hexavalent chromium; and

Hexavalent chromium is an air pollutant which, because of its carcinogenicity, may cause and contribute to an increase in mortality and an increase in serious illness, and poses a hazard to human health; and

WHEREAS, the Board has determined, pursuant to the requirements of the California Environmental Quality Act and Board regulations, that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board approves the proposed regulatory amendments to Section 93000, Title 17, California Administrative Code, as set forth in Attachment A.

I hereby certify that the above is a true and correct copy of Resolution 86-5, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

Attachment A

Amend Title 17, California Administrative Code, Section 93000 to read as follows:

93000. Substances Identified As Toxic Air Contaminants. Each substance identified in this section has been determined by the state board to be a toxic air contaminant as defined in Health and Safety Code Section 39655. If the state board has found there to be a threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, that level is specified as the threshold determination. If the board has found there to be no threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, determination of "no threshold" is specified. If the board has found that there is not sufficient available scientific evidence to support the identification of a threshold exposure level, the "Threshold" column specifies "None identified."

Substance	Threshold
Benzene (C_6H_6)	None identified
Ethylene Dibromide* ($BrCH_2CH_2Br$; 1,2-dibromoethane)	None identified
Ethylene Dichloride* ($ClCH_2CH_2Cl$; 1,2-dichloroethane)	None identified
Hexavalent Chromium (Cr(VI))	None identified

NOTE: Authority cited: Sections 39600, 39601 and 39662, Health and Safety Code. Reference: Sections 39650, 39660, 39661 and 39662, Health and Safety Code.

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* Note: Compounds identified by an asterisk have been identified as toxic air contaminants by the Air Resources Board but not yet approved by the Office of Administrative Law.

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider the Adoption of a Regulatory Amendment Identifying Hexavalent Chromium as a Toxic Air Contaminant

Agenda Item Nos.: 86-1-3

Public Hearing Dates: January 23, 1986

Response Date: January 23, 1986

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

CERTIFIED: _____
Board Secretary

Date: 09-11-86

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 27, 1986

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-77
85-78
85-80
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86-25
86-43
86-44
86-45

State of California
AIR RESOURCES BOARD

Resolution 86-6

January 23, 1986

WHEREAS, Edward A. Smuckler M.D., Ph.D., has served with distinction as a member of the Air Resources Board's Scientific Review Panel on Toxic Air Contaminants from June, 1984 to November, 1985;

WHEREAS, his dedicated efforts, as well as those of his fellow charter members of the Scientific Review Panel, have greatly assisted the Board in the successful implementation of the Toxic Air Contaminant Program;

WHEREAS, he has exhibited the very finest attributes as a physician, scientist and public official in carrying out his duties as a member of the Scientific Review Panel; and

WHEREAS, through his activities with the Scientific Review Panel he has contributed greatly toward improvements in public health for the State of California.

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board extends its deepest appreciation and thanks to Dr. Edward A. Smuckler for his many contributions to environmental protection and the cause of clean air in California.

Jananne Sharpless, Chairwoman

Tirso del Junco, M.D., Member

J. Gordon Kennedy, Member

Roberta H. Hughan, Member

Harriett M. Wieder, Member

Betty S. Ichikawa, Member

Andrew Wortman, Ph.D., Member

State of California
AIR RESOURCES BOARD

Resolution 86-7
February 28, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 95-15, entitled "Effects of Acid Deposition on Materials," has been submitted by Environmental Monitoring & Services, Inc. to the ARB; and

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 95-15 entitled "Effects of Acid Deposition on Materials," submitted by Environmental Monitoring & Services, Inc. for a total amount not to exceed $232,581.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 95-15 entitled "Effects of Acid Deposition on Materials," submitted by Environmental Monitoring & Services, Inc. for a total amount not to exceed $232,581.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $232,581.

I hereby certify that the above is a true and correct copy of Resolution 86-7 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)1
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 95-15 entitled "Effects of Acid Deposition on Materials."

RECOMMENDATION: Adopt Resolution 86-7 approving Proposal No. 95-15 for funding in an amount not to exceed $232,581.

SUMMARY: The purpose of this study is to distinguish the portion of materials damage which is caused by acid deposition from the damage that is induced by non-acidic pollutants or normal weathering in the absence of air pollutants. The Kapiloff Acid Deposition Act requires the Air Resources Board to assess the economic impact of acid deposition upon materials as part of a comprehensive research program to determine the nature, extent and potential effects of acid deposition in California.

The research plan proposed by Environmental Monitoring & Services Inc., (EMSI) includes a combined field and laboratory study. EMSI would study five economically important materials. Ten one-month long laboratory chamber experiments would be conducted to investigate the effects of natural weathering and the relative effects of individual and combinations of aerometric parameters with continuous wet/dry cycles. In addition, a twelve-month field exposure program would be initiated at four California sites. EMSI would also monitor ambient nitric acid concentrations, temperature, and relative humidity. Other aerometric data will be obtained from the existing monitoring network.

This comprehensive laboratory and field study is needed to provide the Board with valuable information on the corrosion rates caused by natural process and anthropogenic pollutants. Such information would be needed in determining the cost-benefit of emission controls with respect to the materials damage for a number of economically important materials in California.

The research contractor would be the Environmental Monitoring & Services Inc., and the Principal Investigator would be Dr. R. Vijayakumar.

BUDGET SUMMARY

Environmental Monitoring & Services, Inc.

"Effects of Acid
Deposition on Materials"

BUDGET ITEMS:

Salaries	$ 84,090	
Benefits	30,456	
Supplies/Equipment*	11,040	
Travel	4,994	
TOTAL, Direct Costs		$130,580
TOTAL, Indirect Costs		102,001
	TOTAL PROJECT COSTS	$232,581

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* Supplies and Equipment include data logger, electrochemical sensors, exposure material and associated supplies.

State of California
AIR RESOURCES BOARD

Resolution 86-8
February 28, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 99-15, entitled "Investigation of the Effects of Acidic Fog and Dew Upon Materials," has been submitted by the University of Southern California; and

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 99-15 entitled "Investigation of the Effects of Acidic Fog and Dew Upon Materials," submitted by the University of Southern California for a total amount not to exceed $249,603.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 99-15 entitled "Investigation of the Effects of Acidic Fog and Dew Upon Materials," submitted by the University of Southern California for a total amount not to exceed $249,603.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $249,603.

I hereby certify that the above is a true and correct copy of Resolution 86-8 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)2
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 99-15 entitled "Investigation of the Effects of Acidic Fog and Dew Upon Materials."

RECOMMENDATION: Adopt Resolution 86-8 approving Proposal No. 99-15 for funding in an amount not to exceed $249,603.

SUMMARY: The purpose of this project is to investigate the contribution to materials damage due to acidic fog and dew. The Kapiloff Acid Deposition Act requires the Air Resources Board to assess the economic impact of acid deposition upon materials as part of a comprehensive research program to determine the nature, extent and potential effects of acid deposition in California.

The research plan by University of Southern California (USC) includes a combined field and laboratory study. USC would study four economically important materials. Fourteen one-month long experiments would be conducted in which the effects of chemical composition and individual components of acidic fog water on corrosion damage would be investigated. The materials would be exposed at four fog-prone sites for up to twelve months in a manner which will allow separation of the contribution to corrosion damage due to fog from the total corrosion loss.

This study is needed by the Board in assessing the economic impact of acid deposition upon materials.

The research contractor would be the University of Southern California, and the principal investigator would be Dr. Florian Mansfeld.

BUDGET SUMMARY

University of Southern California

"Investigation of the Effects of Acidic Fog and Dew Upon Materials"

BUDGET ITEMS:

Salaries	$72,163	
Benefits	24,081	
Supplies/Equipment*	51,207	
Travel	3,578	
TOTAL Direct Costs		$151,029
TOTAL Indirect Costs		98,574
TOTAL PROJECT COSTS		$249,603

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* Supplies and eqipment include four fog monitors ($22,000), data loggers ($20,000), exposure racks, exposure materials, and associated supplies.

State of California
AIR RESOURCES BOARD

Resolution 86-9
February 28, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 101-15, entitled "An Integrated Watershed Study: An Investigation of the Biota in the Emerald Lake System (Sequoia National Park) and Stream Channel Experiments," has been submitted by the University of California, Santa Barbara;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 101-15 entitled "An Integrated Watershed Study: An Investigation of the Biota in the Emerald Lake System (Sequoia National Park) and Stream Channel Experiments," submitted by the University of California, Santa Barbara, for a total amount not to exceed $147,140.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 101-15 entitled "An Integrated Watershed Study: An Investigation of the Biota in the Emerald Lake System (Sequoia National Park) and Stream Channel Experiments," submitted by the University of California, Santa Barbara, for a total amount not to exceed $147,140.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $147,140.

I hereby certify that the above is a true and correct copy of Resolution 86-9 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)3
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 101-15 entitled "An Integrated Watershed Study: An Investigation of the Biota in the Emerald Lake System (Sequoia National Park) and Stream Channel Experiments."

RECOMMENDATION: Adopt Resolution 86-9 approving Proposal No. 101-15 for funding in an amount not to exceed $147,140.

SUMMARY: The purpose of this research is to continue intensive baseline measurements and chemical and biological species at Emerald Lake Basin in Sequoia National Park in order to assess the potential effects of acid deposition upon sensitive ecosystems in California.

The Kapiloff Acid Deposition Act requires that the Air Resources Board investigate the potential for damage to natural ecosystems from acid deposition. Accordingly, the Board has, in cooperation with the National Park Service, established a representative sensitive ecosystem, Emerald Lake Basin, located in Sequoia National Park. Baseline studies of ecosystem parameters, sensitive animal and plant populations and ecosystem cycles and processes are currently underway at the Integrated Watershed Study location.

The first objective of this proposal is to continue biological monitoring in Emerald Lake and its associated streams to allow for an understanding of the natural variation in sensitive indicator populations. Potential changes in these populations can be assessed only after adequate baseline levels have been established.

The second objective of this project is to evaluate the effects of acidic precipitation episodes upon the chemistry and biology of sensitive Sierra streams by means of a series of in-field experiments. These stream channel experiments will be conducted during summer 1986 and biological samples will be analyzed over the following months.

This research project is needed in order to understand the current status of biological species sensitive to acidic deposition and to determine possible changes in natural populations in the Sierra due to anthropogenic inputs. This project is a part of the Board's five-year plan for acid deposition research pursuant to the Kapiloff Act.

The research would be carried out by the University of California at Santa Barbara, and the principal investigator would be Dr. John Melack.

BUDGET SUMMARY

University of California, Santa Barbara

"An Integrated Watershed Study: An Investigation of the Biota in the Emerald Lake System (Sequoia National Park) and Stream Channel Experiments"

BUDGET ITEMS:

Salaries	$79,200	
Benefits	11,099	
Equipment	6,400	
Supplies	7,750	
Other Costs	8,100	
Travel	3,890	
TOTAL, Direct Costs		$116,439
TOTAL, Indirect Costs		30,701
TOTAL PROJECT COST		$147,140

State of California
AIR RESOURCES BOARD

Resolution 86-10
February 28, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1346-121, entitled "Inventory of Chlorophenol Use in the Forest Products Industry and Investigation of Related Emissions of Chlorinated Dibenzodioxins and Dibenzofurans," has been submitted by Systems Applications, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1346-121, entitled "Inventory of Chlorophenol Use in the Forest Products Industry and Investigation of Related Emissions of Chlorinated Dibenzodioxins and Dibenzofurans," submitted by Systems Applications, Inc. for a total amount not to exceed $74,474.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1346-121, entitled "Inventory of Chlorophenol Use in the Forest Products Industry and Investigation of Related Emissions of Chlorinated Dibenzodioxins and Dibenzofurans," submitted by Systems Applications, Inc. for a total amount not to exceed $74,474.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $74,474.

I hereby certify that the above is a true and correct copy of Resolution 86-10 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)4
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal Number 1346-121 entitled "Inventory of Chlorophenol Use in the Forest Products Industry and Investigation of Related Emissions of Chlorinated Dibenzodioxins and Dibenzofurans."

RECOMMENDATION: Adopt Resolution 86-10 approving Proposal Number 1346-121 for funding in an amount not to exceed $74,474.

SUMMARY: The purpose of this project is to develop an emission inventory of the use, distribution and fate of chlorophenols and related compounds, as used in the forest products industry. These compounds are candidates for identification by the ARB as toxic air contaminants.

Section 39650 et seq. of the California Health and Safety Code (Assembly Bill 1807, Tanner, 1983) directs the Air Resources Board to identify toxic air contaminants and, where appropriate, develop emission control strategies. The ARB staff has compiled a list of potential toxic air contaminants to be reviewed according to the criteria specified in AB 1807, which include risk of harm to public health; amount or potential amount of emissions; manner of usage; persistence in the atmosphere; and ambient concentrations. Chlorophenols, polychlorinated dibenzodioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) are included on the list.

Chlorophenols, primarily the penta- and tetrachloro-homologs, are used as fungicides in the preservation of wood and wood products for outdoor and/or underground use. The commercial preparations are often contaminated with residual amounts of PCDDs and PCDFs. In addition, the incineration of such treated wood products has been shown to produce PCDDs and PCDFs, either as volatile products of incomplete combustion or as residual solid in the wood ash itself.

The objectives of this project are to provide an accurate inventory of the use, distribution and fate of these compounds. This information will be used by the ARB and others to assess the risk to public health from chlorophenols and related compounds, as used in the forest products industry.

The Research Screening Committee has recommended that this contract be awarded to Systems Applications, Inc. The principal investigator will be Mr. Pradeep Saxena.

BUDGET SUMMARY

Systems Applications, Inc.

"Inventory of Chlorophenol Use in the Forest Products Industry and Investigation of Related Emissions of Chlorinated Dibenzodioxins and Dibenzofurans"

BUDGET ITEMS:

Salaries	$23,954		
Benefits	25,631		
Supplies	4,050		
Other Costs	2,600		
Travel	185		
TOTAL, Direct Costs			$56,420
TOTAL, Indirect Costs			18,054
		TOTAL PROJECT COST	$74,474

State of California
AIR RESOURCES BOARD

Resolution 86-11
February 28, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1359-122, entitled "Assessment of Emissions of Volatile and Potentially Toxic Organic Compounds from Sewage Treatment Plants and Sewage Collection Systems," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1359-122, entitled "Assessment of Emissions of Volatile and Potentially Toxic Organic Compounds from Sewage Treatment Plants and Sewage Collection Systems," submitted by the University of California, Davis, for a total amount not to exceed $31,656.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1359-122, entitled "Assessment of Emissions of Volatile and Potentially Toxic Organic compounds from Sewage Treatment Plants and Sewage Collection Systems," submitted by the University of California, Davis, for a total amount not to exceed $31,656.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $31,656.

I hereby certify that the above is a true and correct copy of Resolution 86-11 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)5
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1359-122 entitled "Assessment of Emissions of Volatile and Potentially Toxic Organic Compounds from Sewage Treatment Plants and Sewage Collection Systems."

RECOMMENDATION: Adopt Resolution 86-11 approving Proposal No. 1359-122 for funding in an amount not to exceed $31,656.

SUMMARY: This proposed project is part of the Board's program to identify toxic air contaminants and to assess their associated health risks in accordance with the Health and Safety Code. Sewage treatment plants and collection systems are sources of potentially toxic volatile organic hydrocarbons. A recent study sponsored by the Environmental Protection Agency indicates that as many as 16 toxic compounds may be emitted from these sources. Eight of these compounds have been identified by the Air Resources Board as potential toxic air contaminants to be reviewed in accordance with AB 1807 (Section 39650 et seq. of the California Health and Safety Code; Assembly Bill 1807, Tanner, 1983). Based upon data compiled by the EPA for two facilities in the South Coast Air Basin and three in the Bay Area, the toxic emissions from California sewage treatment plants are estimated to be approximately 4000 metric tons per year.

The objectives of this research project are to quantify the emissions of hydrocarbons and volatile toxic organic compounds from publicly owned sewage treatment plants and collection systems in California. This inventory would include not only the gaseous effluents emitted though volatilization from sewage systems but also the emissions from sludges and other ad/absorbents collected from these treatment plants and disposed of through landfills, landfarming or other means.

The contractor would compile these data primarily through a literature search; by contacting knowledgeable personnel from the State Regional Water Quality Control Boards; and by

surveying the major water treatment facilities for data on plant operations and systems. Based on all of this information, the contractor would estimate emissions of potential or identified toxic air contaminants from this emission source.

The results of this project will be used by the ARB staff and others to assist in risk assessment and, as required, for risk management for certain toxic air contaminants emitted from sewage treatment plants and collection systems.

This research will be carried out by the University of California at Davis. The principal investigator would be Dr. Daniel Chang; co-principal investigator would be Dr. Edward Schroeder from the Department of Civil Engineering.

BUDGET SUMMARY

University of California, Davis

"Assessment of Emissions of Volatile and Potentially Toxic Organic Compounds From Sewage Treatment Plants and Sewage Collection Systems"

BUDGET ITEMS:

Salaries	$22,387	
Benefits	3,613	
Supplies	200	
Other Costs	1,025	
Travel	1,553	
TOTAL, Direct Costs		$28,778
TOTAL, Indirect Costs		2,878
TOTAL PROJECT COST		$31,656

State of California
AIR RESOURCES BOARD

Resolution 86-12
February 28, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1361-122, entitled "Study to Determine the Fate of Benzene Precursors in Gasoline," has been submitted by the National Institute for Petroleum and Energy Research;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1361-122, entitled "Study to Determine the Fate of Benzene Precursors in Gasoline," submitted by the National Institute for Petroleum and Energy Research, for a total amount not to exceed $249,892.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1361-122, entitled "Study to Determine the Fate of Benzene Precursors in Gasoline," submitted by the National Institute for Petroleum and Energy Research, for a total amount not to exceed $249,892.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $249,892.

I hereby certify that the above is a true and correct copy of Resolution 86-12 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)6
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal NO. 1361-122 entitled "Study to Determine the Fate of Benzene Precursors in Gasoline."

RECOMMENDATION: Adopt Resolution 86-12 approving Proposal No. 1361-122 for funding in an amount not to exceed $249,892.

SUMMARY: Benzene has been identified by the Air Resources Board as a toxic air contaminant to be regulated in accordance with AB 1807 (Section 39650, et seq. of the California Health and Safety Code; Assembly Bill 1807, Tanner, 1983). Automotive emissions (exhaust and evaporative) and emissions from gasoline marketing operations constitute the largest known sources of benzene present in the atmosphere. Based on an inventory compiled by ARB staff, annual benzene emissions statewide are about 16,100 tons, 83 percent of which originate from vehicular exhaust.

Previous studies sponsored by ARB indicate that benzene concentrations are greater in the hydrocarbon fraction of the exhaust emissions than in the gasoline fuel used in vehicles with or without catalytic converters. Data from these tests and other information compiled by ARB staff suggest that a correlation may exist between the aromatic content of gasoline and the benzene content in the exhaust from both catalyst and non-catalyst equipped light-duty vehicles.

The objectives of this research project are to identify the specific aromatic compounds (e.g., toluene, isomers of xylene, ethylbenzene, etc.) that are converted, in the engine or in the catalyst, to form benzene and to quantify the effects of the concentrations of these compounds in gasoline upon the benzene concentration in the exhaust emissions.

The contractor will achieve these objectives by combusting synthetic fuels spiked with varying concentrations of specified aromatic compounds and determining the concentrations of benzene in the exhaust of pre-and post-catalytic converter samples. Federal Test Procedure emission tests would be conducted using each of the synthetic fuels in five 1985-86 model test vehicles equipped with a variety of fuel induction and exhaust control systems.

State of California
AIR RESOURCES BOARD

Resolution 86-13
February 28, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1370-123, entitled "Inhalation Toxicology of Combined Acid and Soot Particles," has been submitted by the University of California, Irvine;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1370-123, entitled "Inhalation Toxicology of Combined Acid and Soot particles," submitted by the University of California, Irvine, for a total amount not to exceed $302,651.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1370-123, entitled "Inhalation Toxicology of Combined Acid and Soot Particles," submitted by the University of California, Irvine, for a total amount not to exceed $302,651.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $302,651.

I hereby certify that the above is a true and correct copy of Resolution 86-13 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)7
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1370-123 entitled "Inhalation Toxicology of Combined Acid and Soot Particles."

RECOMMENDATION: Adopt Resolution 86-13 approving Proposal No. 1370-123 for funding in an amount not to exceed $302,651.

SUMMARY: This proposal is for the second and third years of a planned 3-year project to evaluate the acute toxicity of inhaled acids, alone and in combination with soot particles. This study will provide important toxicologic information on previously unstudied pollutant mixtures similar to those which might be observed in California.

The study will use sensitive assessments of lung injury: structural damage, physiological impairment (clearance), and immunological alterations. The protocols are designed to observe early and residual effects and a nose-only exposure system has the advantage of preventing neutralization of airborne acids by animal-generated ammonia. During the first year of this study the contractor modified existing exposure facilities to accept a propane soot generator and dilute exhaust from a diesel engine, as requested by the ARB. Test atmospheres were generated and characterized, and initial acid-soot exposures were performed.

The proposed research would be carried out by the University of California, Irvine. The principal investigator would be Dr. Robert Phalen.

BUDGET SUMMARY

University of California, Irvine

"Inhalation Toxicology of Combined Acid and Soot Particles"

BUDGET ITEMS:

Salaries	$85,215	
Benefits	23,948	
Supplies	36,595	
Equipment**	34,300	
Other Costs*	38,500	
Travel	3,400	
TOTAL, Direct Costs		$221,958
TOTAL, Indirect Costs		80,693
TOTAL PROJECT COST		$302,651

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* Fees for USC Morphometric Study $29,300
Physical Plant, Film Badges, Waste Disposal 5,000
Consultant Costs 4,200

** Incubator 2,000
Stages 9 & 10 Cascade Impactor 1,000
Lundgren low-pressure Impactor 2,700
Nose-only Exposure Systems(2) 14,800
Formaldemeter 800
CO, CO_2 Analyzer 5,000
Gas Chromatograph 6,000
Repairs and upgrades to existing equipment 2,000

State of California
AIR RESOURCES BOARD

Resolution 86-14
February 28, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1369-123, entitled "Genotoxicity of Diesel Exhaust Particles and Vapors Collected from Engines with and without Particulate Trap Oxidizers," has been submitted by the University of California, Irvine;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1369-123, entitled "Genotoxicity of Diesel Exhaust Particles and Vapors Collected from Engines with and without Particulate Trap Oxidizers," submitted by the University of California, Irvine for a total amount not to exceed $188,207.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1369-123, entitled "Genotoxicity of Diesel Exhaust Particles and Vapors Collected from Engines with and without Particulate Trap Oxidizers," submitted by the University of California, Irvine for a total amount not to exceed $188,207.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $188,207.

I hereby certify that the above is a true and correct copy of Resolution 86-14 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)8
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1369-123 entitled "Genotoxicity of Diesel Exhaust Particles and Vapors Collected from Engines with and without Particulate Trap Oxidizers."

RECOMMENDATION: Adopt Resolution 86-14 approving Proposal No. 1369-123 for funding in an amount not to exceed $188,207.

SUMMARY: As part of the program to reduce emissions from diesel vehicles, the Air Resources Board is sponsoring testing of catalytic particle traps on heavy-duty diesel engines and has adopted a regulation that may necessitate the use of particle traps on some light-duty diesel vehicles. The efficiency of these traps in removing harmful mutagens and carcinogens, which are known to occur in diesel exhaust, is not known.

The objective of this study is to assess the mutagenicity of exhaust particles and vapors emitted from heavy-duty diesel bus engines and from light-duty diesel passenger car engines operating under various conditions with and without particle traps. Collection of particles and vapors from the exhaust of one engine will be performed at intervals during the time the bus is operated on city streets to study whether the performance of the trap decays with use. Staff of the Board's Haagen-Smit Laboratory will obtain the samples when the bus is returned to the laboratory for durability testing of the emission control system. Results of the *in vitro* tests will be used to assess the effectiveness of the particle traps in removing mutagenic materials from the exhaust streams.

The proposed research would be carried out by the University of California, Irvine. The principal investigator would be Dr. Ronald Rasmussen.

BUDGET SUMMARY

University of California, Irvine

"Genotoxicity of Diesel Exhaust Particles and Vapors Collected from Engines with and without Particulate Trap Oxidizers"

BUDGET ITEMS:

Salaries	$85,558	
Benefits	24,065	
Supplies	19,630	
Other Costs	2,360	
Travel	-0-	
TOTAL, Direct Costs		$131,613
TOTAL, Indirect Costs		56,594
	TOTAL PROJECT COST	$188,207

State of California
AIR RESOURCES BOARD

Resolution 86-15
February 28, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1353-121, entitled "Development of Test Procedures to Determine Emissions from Open Burning of Agricultural and Forestry Wastes," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1353-121, entitled "Development of Test Procedures to Determine Emissions from Open Burning of Agricultural and Forestry Wastes," submitted by the Universtiy of California, Davis, for a total amount not to exceed $124,249.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1353-121, entitled "Development of Test Procedures to Determine Emissions from Open Burning of Agricultural and Forestry Wastes," submitted by the University of California, Davis, for a total amount not to exceed $124,249.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $124,249.

I hereby certify that the above is a true and correct copy of Resolution 86-15 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-2-5(b)9
DATE: February 28, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal Number 1353-121 entitled "Development of Test Procedures to Determine Emissions from Open Burning of Agricultural and Forestry Wastes."

RECOMMENDATION: Adopt Resolution 86-15 approving Proposal Number 1353-121 for funding in an amount not to exceed $124,249.

SUMMARY: AB 1223 requires that emission offset credits be granted in the permitting of new waste burning facilities using materials that would otherwise be burned in the field. The purpose of this study is provide a test facility for the accurate measurement of emission factors needed to assess the magnitude of emission credits.

The specific objectives of this project are to develop the experimental equipment, facilities and test procedures for determining emissions of criteria pollutants and toxic materials from burning of agricultural and forestry wastes, which can be applied to the development of emission offsets in accordance with AB 1223. A test apparatus is to be constructed to simulate open burning conditions as closely as possible while maintaining controlled conditions of material burn rate, air velocity, material moisture content, initial material distribution, boundary conditions, aerodnamic similarity and other factors which may influence the combustion of residues in the field.

The test equipment will be built, operated and maintained on a site at the University of California, Davis. Overall conduct of the project will be managed through the Agricultural Engineering Department by Dr. Bryan M. Jenkins. Drs. Daniel P. Y. Chang and Otto G. Raabe will provide assistance and guidance for the measurement and analysis of emissions.

BUDGET SUMMARY

University of California, Davis

"Development of Test Procedures to Determine Emissions from Open Burning of Agricultural and Forestry Wastes"

BUDGET ITEMS:

Salaries	$54,296	
Benefits	13,193	
Equipment*	30,366	
Supplies	14,700	
Other Costs	1,200	
Travel	1,960	
TOTAL, Direct Costs		$115,715
TOTAL, Indirect Costs		8,534
	TOTAL PROJECT COST	$124,249

*Blower; fans; flowmeter; NOx, SO_2 and benzene analyzers

State of California
AIR RESOURCES BOARD

Resolution 86-16
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1385-124, entitled "Retention and Metabolism of Toxics: Inhalation Uptake of Xenobiotic Vapors by People," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1385-124, entitled "Retention and Metabolism of Toxics: Inhalation Uptake of Xenobiotic Vapors by People," submitted by the University of California, Davis, for a total amount not to exceed $119,023.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1385-124, entitled "Retention and Metabolism of Toxics: Inhalation Uptake of Xenobiotic Vapors by People," submitted by the University of California, Davis, for a total amount not to exceed $119,023.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $119,023.

I hereby certify that the above is a true and correct copy of Resolution 86-16 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (1)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1385-124 entitled "Retention and Metabolism of Toxics: Inhalation Uptake of Xenobiotic Vapors by People"

RECOMMENDATION: Adopt Resolution 86-16 approving Proposal No. 1385-124 for funding in an amount not to exceed $119,023.

SUMMARY: The Toxic Air Contaminant program requires information on the absorption of inhaled toxic substances in order to model accurately the health risks of populations exposed to these substances. The proponent has recently completed a study which measured the uptake by inhalation of trace levels of six selected organic toxicants in laboratory animals. The validity of extrapolation of the results obtained from animal studies to apply to humans is often uncertain. The proposed study will eliminate this source of uncertainty because data will be derived from human subjects.

The exposure apparatus and techniques developed in the prior study will measure the inhalation uptake of trace levels of five of these six compounds in human volunteers. Separate measurements for oral and for nasal inhalation will determine whether the route of inhalation affects the uptake of each compound. The use of low levels (approximately 10 ppb) of these compounds will ensure that the data will be applicable to estimation of risk under ambient conditions, where the levels of toxic air contaminants are very low.

The principal investigator, Dr. Otto Raabe, will perform the research at the University of California, Davis.

BUDGET SUMMARY

University of California, Davis

"Retention and Metabolism of Toxics: Inhalation Uptake of Xenobiotic Vapors by People"

BUDGET ITEMS:

Salaries	$69,660		
Benefits	19,358		
Supplies*	18,610		
Other Costs	300		
Travel	275		
TOTAL, Direct Costs			$108,203
TOTAL, Indirect Costs			10,820
		TOTAL PROJECT COST	$119,023

* Radiolabeled vapors $11,000
Other laboratory and office supplies 7,610

State of California
AIR RESOURCES BOARD

Resolution 86-17
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1384-124, entitled "Effects of Ozone on Cellular Synthesis and Viral Replication In Vitro," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1384-124, entitled "Effects of Ozone on Cellular Synthesis and Viral Replication In Vitro," submitted by the University of California, Davis, for a total amount not to exceed $43,353.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1384-124, entitled "Effects of Ozone on Cellular Synthesis and Viral Replication In Vitro," submitted by the University of California, Davis, for a total amount not to exceed $43,353.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $43,353.

I hereby certify that the above is a true and correct copy of Resolution 86-17 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (2)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1384-124 entitled "Effects of Ozone on Cellular Synthesis and Viral Replication *In Vitro*"

RECOMMENDATION: Adopt Resolution 86-17 approving Proposal No. 1384-124 for funding in an amount not to exceed $43,353.

SUMMARY: Current indicators of health damage such as death, illness or impaired respiratory function are, in many ways, rudamentary. There is a need to develop indicators to increase the sensitivity of assessing health effects by detecting more subtle, early markers of change and a need to link such sensitive indicators to subsequent gross disease. Measurable changes at the biochemical and cellular level are expected to provide sensitive indications of subsequent disease.

This is to be the second year of a two-year study. The proponent uses an exposure system designed to expose various animal cells *in vitro* to ozone. He is studying: 1. the relationship between ozone concentrations and early indicators of cellular damage in several cell lines; 2. The effects of ozone on the replication of several animal and human viruses; and 3. the effect of ozone on the ability of cells to produce interferon. The principal investigator, Dr. Yuan-Chung Zee, will perform the research at the University of California, Davis.

State of California
AIR RESOURCES BOARD

Resolution 86-18
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1386-124, entitled "Field Intercomparison of Sampling and Analysis Procedures for Carbonaceous Aerosols and Gases: Coordination and Data Analysis," has been submitted by the University of California, Los Angeles;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1386-124, entitled "Field Intercomparison of Sampling and Analysis Procedures for Carbonaceous Aerosols and Gases: Coordination and Data Analysis," submitted by the University of California, Los Angeles, for a total amount not to exceed $117,417.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the and approves the following:

> Proposal Number 1386-124, entitled "Field Intercomparison of Sampling and Analysis Procedures for Carbonaceous Aerosols and Gases: Coordination and Data Analysis," submitted by the University of California, Los Angeles, for a total amount not to exceed $117,417.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $117,417.

I hereby certify that the above is a true and correct copy of Resolution 86-18 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (3)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1386-124 entitled "Field Intercomparison of Sampling and Analysis Procedures for Carbonaceous Aerosols and Gases: Coordination and Data Analysis"

RECOMMENDATION: Adopt Resolution 86-18 approving Proposal No. 1386-124 for funding in an amount not to exceed $117,417.

SUMMARY:

The Air Resources Board is sponsoring a multi-year, integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July 1987. The overall objective of that program is to develop a comprehensive meteorological and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. An important component of the field study will be the accurate measurement of carbonaceous species in a multi-station network mode. Therefore, it is necessary to perform a carbonaceous species methods comparison study in Los Angeles, the major objective of which will be to determine measurement methods for gas and particle phase carbon-containing compounds, which can be used in a multi-station monitoring mode in Los Angeles, whose validity, accuracy and precision are known.

This proposal is to coordinate and assist the Research Division of the ARB in a field intercomparison of measurements methods for carbonaceous compounds in the South Coast Air Basin. Approximately 12 groups, including researchers from the U. S. Environmental Protection Agency, will be participating in a 7-10 day field sampling study in August 1986. The major emphasis of the study will be to validate simple and inexpensive methods for sampling airborne carbon-containing pollutants.

The proposed effort consists of four tasks: 1) experimental design, site preparation and protocol development; 2) study management; 3) data retrieval; and 4) data analysis and report preparation. The contractor will work under the direct supervision of the Research Division staff in coordinating this major methods comparison study.

BUDGET SUMMARY

University of California, Los Angeles

"Field Intercomparison of Sampling and Analysis Procedures for Carbonaceous Aerosols and Gases: Coordination and Data Analysis"

BUDGET ITEMS:

Salaries	$27,997	
Benefits	7,149	
Supplies*	47,300	
Other Costs, Consultant	5,800	
Travel and per diem	7,930	
TOTAL, Direct Costs		$96,176
TOTAL, Indirect Costs		21,241
	TOTAL PROJECT COST	$117,417

*Includes:

o	site preparation, electrical power and clean up	$22,500
o	sampling platform rental	5,000
o	cylinder gases	2,000
o	telephone and incidental	1,000
o	security guard duty	14,000
o	secretarial, xeroxing and computer costs	2,800

State of California
AIR RESOURCES BOARD

Resolution 86-19
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1382-124, entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1382-124, entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species," submitted by the University of California, Riverside, for a total amount not to exceed $37,654.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1382-124, entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species," submitted by the University of California, Riverside, for a total amount not to exceed $37,654.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $37,654.

I hereby certify that the above is a true and correct copy of Resolution 86-19 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (4)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1382-124 entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species: Chromatography"

RECOMMENDATION: Adopt Resolution 86-19 approving Proposal No. 1382-124 for funding in an amount not to exceed $37,654.

SUMMARY:

The Air Resources Board is sponsoring a multi-year, integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July 1987. The overall objective of that program is to develop a comprehensive meteorological and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. An important component of the field study will be the accurate measurement of carbonaceous species in a multi-station mode. Therefore, it is necessary to perform a carbonaceous species methods comparison study in Los Angeles. The major objective of this study will be to determine measurement methods for gas and particle phase carbonaceous pollutants, which can be used in a multi-station monitoring mode in Los Angeles, whose validity, accuracy and precision are known.

This proposal will be conducted in conjunction with the Statewide Air Pollution Research Center study on the role of nitrogenous pollutants in the formation of atmospheric mutagens and acid deposition. UCR proposes to measure gas and particle phase C_{20} alkanes, gas and particle phase PAH's and gas phase C_{10}-C_{20} alkanes during the study. Samples will be collected on Hi-Vol filters, polyurethane foam (PUF) plugs behind Hi-Vol filters and Tenax solid sorbent. Analysis will be performed by extraction, followed by a variety of methods: gas chromatography, liquid chromatography, and gas chromatography-mass spectrometry.

State of California
AIR RESOURCES BOARD

Resolution 86-20
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1377-124, entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species," has been submitted by Environmental Monitoring & Services, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1377-124, entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species," submitted by Environmental Monitoring & Services, Inc., for a total amount not to exceed $25,938.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1377-124, entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species," submitted by Environmental Monitoring & Services, Inc., for a total amount not to exceed $25,938.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $25,938.

I hereby certify that the above is a true and correct copy of Resolution 86-20 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (5)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1377-124 entitled "Intercomparison of Methods for the Measurement of Carbonaceous Aerosol Species: Quality Assurance"

RECOMMENDATION: Adopt Resolution 86-20 approving Proposal No. 1377-124 for funding in an amount not to exceed $25,938.

SUMMARY: The Air Resources Board is sponsoring a multi-year, integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July 1987. The overall objective of that program is to develop a comprehensive meteorological and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. An important component of the field study will be the accurate measurement of carbonaceous species in a multi-station network mode. Therefore, it is necessary to perform a carbonaceous species methods comparison study in Los Angeles, the major objective of which will be to determine measurement methods for gas and particle phase carbon-containing compounds, which can be used in a multi-station monitoring mode whose validity, accuracy and precision are known.

The proposed project would have EMSI serve as the reference laboratory during the carbon intercomparison study. EMSI proposes to analyze portions of all the samples taken by the different investigators during the field study, and thus provide an unambiguous comparison of the various sampling methods employed. This procedure will provide an evaluation of the influence of samples flow rate, sampling period, sampler-induced artifacts, and ambient conditions. By serving as the reference laboratory, a satisfactory quality assurance program for the carbonaceous species methods comparison study will be implemented.

State of California
AIR RESOURCES BOARD

Resolution 86-21
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1380-124, entitled "Sampling and Analysis of Organic Aerosol," has been submitted by the Oregon Graduate Center;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1380-124 entitled "Sampling and Analysis of Organic Aerosol," submitted by the Oregon Graduate Center, for a total amount not to exceed $49,446.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the and approves the following:

> Proposal Number 1380-124 entitled "Sampling and Analysis of Organic Aerosol," submitted by the Oregon Graduate Center, for a total amount not to exceed $49,446.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $49,446.

I hereby certify that the above is a true and correct copy of Resolution 86-21 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (6)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1380-124 entitled "Sampling and Analysis of Organic Aerosol"

RECOMMENDATION: Adopt Resolution 86-21 approving Proposal No. 1380-124 for funding in an amount not to exceed $49,446.

SUMMARY: The Air Resources Board is sponsoring a multi-year, integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July 1987. The overall objective of that program is to develop a comprehensive meteorological and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. An important component of the field study will be the accurate measurement of carbonaceous species in a multi-station network mode. Therefore, it is necessary to perform a carbonaceous species methods comparison study in Los Angeles. The major objective of this study will be to evaluate measurement methods for gas and particle phase carbon-containing compounds, which can be used in a multi-station monitoring mode, whose validity, accuracy and precision are known.

This project will compare organic and elemental carbon analytical data from the OGC analyzer with other participants' results. In addition, an in situ carbon analyzer will be used for time-resolved organic and elemental carbon data. This study will also investigate the influence of sampling conditions on the collected sample. Gas chromatography-mass spectrometry analysis will be performed for major species on backup filters to assess the chemical composition of species involved in volatilization and/or absorption on filters.

State of California
AIR RESOURCES BOARD

Resolution 86-22
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1373-124, entitled "The Effects of Ozone on Primary Determinants of Plant Productivity," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1373-124, entitled "The Effects of Ozone on Primary Determinants of Plant Productivity," submitted by the University of California, Riverside, for a total amount not to exceed $59,714.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1373-124, entitled "The Effects of Ozone on Primary Determinants of Plant Productivity," submitted by the University of California, Riverside, for a total amount not to exceed $59,714.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $59,714.

I hereby certify that the above is a true and correct copy of Resolution 86-22 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (7)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1373-124 entitled "The Effects of Ozone on Primary Determinants of Plant Productivity"

RECOMMENDATION: Adopt Resolution 86-22 approving Proposal No. 1373-124 for funding in an amount not to exceed $59,714.

SUMMARY: The objectives of this study are: (1) to determine the relationships among ozone exposure, physiological response, and plant growth, and (2) to determine interspecific variation among these relationships for four California crops. Dr. David M. Olszyk and Dr. Robert L. Heath, principal investigators, will conduct the project at the University of California, Riverside.

The investigators will test the hypothesis that physiological measurements, such as photosynthetic rates during growth, indicate the eventual yield of plants, even in different species.

Plants will be grown in hydroponic (water) culture to permit harvesting of entire plants. This will facilitate establishing the relationship between differences in physiological responses, such as photosynthesis rates, and differences in plant growth. The investigators will keep the plants in filtered air greenhouses and expose them to ozone in closed top exposure chambers inside of the greenhouses. This environment will provide the uniform conditions needed for reliable physiological measurements which a study of this type requires. The proposed study is in two parts. The first part will use spinach as the experimental plant to test and refine the experimental protocol. The second part will examine the effects of ozone on rice, lettuce, cauliflower, and cantaloupe melons.

The proposed study can support the ARB's program in crop loss assessment for several important reasons. First, it would be a significant step toward understanding the general response of plants to air pollution exposure in a way that can cut across

species and varietal differences by measuring changes in processes that occur in all higher plants. Second, the methods for measuring physiological indicators are adaptable to field use so that gathering these kinds of data in the future would not be restricted to the controlled greenhouse environment. Third, clarifying the role of physiology as the mediator between air pollution exposure and yield loss may lead to reasonable yield loss estimates for a number of species without the need for chamber studies over a complete season in each and every case.

BUDGET SUMMARY

University of California, Riverside

"The Effects of Ozone on Primary Determinants of Plant Productivity"

BUDGET ITEMS:

Salaries	$35,332	
Benefits	8,850	
Equipment*	2,270	
Supplies	4,250	
Other Costs	1,840	
Travel	1,950	
TOTAL, Direct Costs		$54,492
TOTAL, Indirect Costs		5,222
TOTAL PROJECT COST		$59,714

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* Equipment includes: cuvette (0.25 liter), hardware package, and rechargeable battery pack for Lamda Instrument LI 6000 portable photosynthesis system.

State of California
AIR RESOURCES BOARD

Resolution 86-23
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1374-124, entitled "Time Series Analysis of Mortality and Associated Weather and Pollution Effects in Los Angeles County," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1374-124, entitled "Time Series Analysis of Mortality and Associated Weather and Pollution Effects in Los Angeles County," submitted by the University of California, Davis, for a total amount not to exceed $51,546.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1374-124, entitled "Time Series Analysis of Mortality and Associated Weather and Pollution Effects in Los Angeles County," submitted by the University of California, Davis, for a total amount not to exceed $51,546.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $51,546.

I hereby certify that the above is a true and correct copy of Resolution 86-23 as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (8)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1374-124 entitled "Time Series Analysis of Mortality and Associated Weather and Pollution Effects in Los Angeles County"

RECOMMENDATION: Adopt Resolution 86-23 approving Proposal No. 1374-124 for funding in an amount not to exceed $51,546.

SUMMARY: Several studies have investigated daily mortality, pollution, and weather data to determine whether there are any consistent relationships between mortality and pollution in large metropolitan areas, adjusting for the effects of weather. This approach of correlating daily fluctuations solves one of the problems of traditional epidemiological studies, namely the need to find an appropriate control or unexposed group. Many of the analyses have indicated that there is a positive effect of pollution on mortality. However, there have not been extensive analyses of this type for California, which has its own characteristic types of pollution.

This preliminary investigation of the association between daily pollution, weather, and mortality in Los Angeles County in the years 1972-79 will derive a dose-reponse relationship if a positive association is obtained. The proponent will analyze the data by sophisticated time-series methods that he has successfully applied to similar data from London in previous work for the Air Resources Board. The study will yield information about adverse health effects of atmospheric conditions in Los Angeles County.

State of California
AIR RESOURCES BOARD

Resolution 86-24
March 27, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1365-123, entitled "Evaluation of Emissions from Selected Uninventoried Sources," has been submitted by the Radian Corporation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1365-123, entitled "Evaluation of Emissions from Selected Uninventoried Sources," submitted by the Radian Corporation, for a total amount not to exceed $74,999.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1365-123, entitled "Evaulation of Emissions from Selected Uninventoried Sources," submitted by the Radian Corporation, for a total amount not to exceed $74,999.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $74,999.

I hereby certify that the above is a true and correct copy of Resolution 86-24 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-4-3 (b) (8)
DATE: March 27, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1365-123 entitled "Evaluation of Emissions from Selected Uninventoried Sources"

RECOMMENDATION: Adopt Resolution 86-24 approving Proposal No. 1365-123 for funding in an amount not to exceed $74,999.

SUMMARY: The purpose of this project is to compile an inventory of emissions of photochemically reactive volatile hydrocarbons, particulate matter (PM_{10}) and criteria pollutants from approximately 40 uninventoried sources. These sources, identified by the Emission Inventory Technical Advisory Committee (EITAC) are not currently included in the statewide emission inventory. Because these emissions occur in areas which exceed the state and federal ambient air quality standards for the respective pollutants, it is important that such emissions be quantified and documented.

The objectives of this research project, consistent with the long-term goal of reducing uncertainty in the statewide emission inventory, are to: (1) identify the magnitude and potential significance of certain uninventoried emission sources; and (2) develop methods for inventorying significant uninventoried sources of emissions in a statistically sound manner.

To compile this inventory, the contractor will conduct a literature search for information concerning emissions of volatile organic hydrocarbons, particulate matter and criteria pollutants from each source type, and then list the source categories in order of decreasing emissions. The contractor will select for further refinement the emissions from the largest source categories and in an interim report to the ARB staff detail the methods, for ARB approval, to be used in this refinement. In addition to the listed pollutants the contractor will also identify and estimate emissions of toxic pollutants.

The Research Screening Committee has recommended that a contract be awarded to the Radian Corporation. Mr. William Oliver will be the Program Manager.

State of California
AIR RESOURCES BOARD

Resolution 86-25

March 28, 1986

Agenda Item No.: 86-4-1

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to do such acts and to adopt such regulations as may be necessary for the proper execution of the powers and duties granted to, and imposed upon, the Board by law;

WHEREAS, Chapter 3.5 (commencing with Section 39650) of Part 2 of Division 26 of the Health and Safety Code establishes procedures for the identification of toxic air contaminants by the Board;

WHEREAS, Section 39655 of the Health and Safety Code defines a "toxic air contaminant" as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health, and specifies that substances which have been identified by the Environmental Protection Agency (EPA) as hazardous air pollutants pursuant to Section 112 of the federal Clean Air Act (42 U.S.C. Section 7412) shall be identified by the Board as toxic air contaminants;

WHEREAS, Section 39662 of the Health and Safety Code directs the Board to list, by regulation, substances determined to be toxic air contaminants, and to specify for each substance listed a threshold exposure level, if any, below which no significant adverse health effects are anticipated;

WHEREAS, EPA has identified asbestos as a hazardous air pollutant pursuant to Section 112 of the federal Clean Air Act;

WHEREAS, asbestos is emitted from sources such as mining and milling of asbestos ore, manufacturing of asbestos products, automobile braking, and quarrying, and has been measured in the atmopshere;

WHEREAS, pursuant to the request of the Board, the Department of Health Services (DHS) evaluated the health effects of asbestos in accordance with Section 39660 of the Health and Safety Code;

WHEREAS, DHS concluded in its evaluation that asbestos is an animal and human carcinogen, and has been documented to cause cancer in humans in both occupational and nonoccupational settings; asbestos should be treated as a substance without a carcinogenic threshold; health effects other than cancer are not expected to occur at existing ambient asbestos levels nor are present levels expected to result in asbestosis; and the maximum excess lifetime risk

from asbestos exposure of lung cancer is estimated to range between 11 and 110 cases per million for each 100 PCM (phase contrast microscopy) fibers per cubic meter of asbestos exposure, and for mesothelioma is estimated to range between 38 and 190 cases for each 100 PCM fibers per cubic meter of asbestos exposure.

WHEREAS, for the reasons set forth in its evaluation, DHS has concluded that, in the absence of strong positive evidence that carcinogenic substances act only through mechanisms which ought to have a threshold, these substances should be treated as acting without a threshold, and DHS has determined that no positive evidence of a carcinogenic threshold exists with respect to asbestos;

WHEREAS, upon receipt of the DHS evaluation, staff of the Board prepared a report including and in consideration of the DHS evaluation and recommendations and in the form required by Section 39661 of the Health and Safety Code and, in accordance with the provisions of that section, made the report available to the public and submitted it for review to the Scientific Review Panel (SRP) established pursuant to Section 39670 of the Health and Safety Code;

WHEREAS, in accordance with Section 39661 of the Health and Safety Code, the SRP reviewed the staff report, including the scientific procedures and methods used to support the data in the report, the data itself, and the conclusions and assessments on which the report was based, considered the public comments received regarding the report, and, on January 15, 1986 submitted its written findings to the Board;

WHEREAS, the SRP found to be prudent interpretations of the available evidence the propositions that:

> Asbestos (including chrysotile, actinolite, amosite, anthophyllite, crocidolite, and tremolite) is a human and animal carcinogen, and has been documented to cause cancer in humans in both occupational and nonoccupational settings.
>
> Although the mechanism of asbestos carcinogenicity is unknown, there is no compelling evidence that this process is characterized by a threshold.
>
> Health effects other than cancer are not anticipated at current exposure levels.

WHEREAS, the SRP found the staff report to be without serious deficiency, and included in its findings the statement that it agreed that asbestos should be listed by the Air Resources Board as a toxic air contaminant, but was unable to recommend an exposure level below which carcinogenic effects would not occur;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, in consideration of the staff report, including DHS' evaluation and recommendations, the available evidence, the findings of the SRP, and the written comments and public testimony it has received, the Board finds that:

> Asbestos [asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), tremolite, actinolite, and anthophyllite] is an animal and human carincogen.
>
> Health effects other than cancer are not anticipated at current ambient asbestos exposure levels;
>
> There is not sufficient available scientific evidence to support the identification of a threshold exposure level for asbestos; and
>
> Asbestos is an air pollutant which, because of its carcinogenicity, may cause and contribute to an increase in mortality and an increase in serious illness, and poses a hazard to human health; and

WHEREAS, the Board has determined, pursuant to the requirements of the California Environmental Quality Act and Board regulations, that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board approves the proposed regulatory amendments to Section 93000, Title 17, California Administrative Code, as set forth in Attachment A.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the amendments, as set forth in Attachment A, after making it available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments regarding the changes to the regulation as originally proposed as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

I hereby certify that the above is a true and correct copy of Resolution 86-25, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

Attachment A

Amend Title 17, California Administrative Code, Section 93000 to read as follows:

93000. Substances Identified As Toxic Air Contaminants. Each substance identified in this section has been determined by the state board to be a toxic air contaminant as defined in Health and Safety Code Section 39655. If the state board has found there to be a threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, that level is specified as the threshold determination. If the board has found there to be no threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, determination of "no threshold" is specified. If the board has found that there is not sufficient available scientific evidence to support the identification of a threshold exposure level, the "Threshold" column specifies "None identified."

Substance	Threshold
Benzene (C_6H_6)	None identified
Ethylene Dibromide ($BrCH_2CH_2Br$; 1,2-dibromoethane)	None identified
Ethylene Dichloride ($ClCH_2CH_2Cl$; 1,2-dichloroethane)	None identified
Hexavalent Chromium Cr(VI)*	None identified
~~Asbestos (in the following forms: chrysotile, actinolite, amosite, anthophyllite, crocidolite, and tremolite)~~	None identified
Asbestos [asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), tremolite, actinolite, and anthophyllite]	

NOTE: Authority cited: Sections 39600, 39601 and 39662, Health and Safety Code. Reference: Sections 39650, 39660, 39661 and 39662, Health and Safety Code.

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* Compounds identified by an asterisk have been identified as toxic air contaminants by the Air Resources Board but not yet approved by the Office of Administrative Law.

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider the Adoption of a Regulatory Amendment Identifying Asbestos as a Toxic Air Contaminant

Agenda Item No.: 86-4-1

Public Hearing Date: March 28, 1986

Response Date: May 1, 1986

Issuing Authority: Air Resources Board

Comments: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

CERTIFIED: _____
Board Secretary

Date: October 3, 1986

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 27, 1986

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-77
85-78
85-80
86-4
86-25
86-43
86-44
86-45

State of California
AIR RESOURCES BOARD

Resolution 86-26
March 27, 1986

WHEREAS, the Legislature has declared that an effective research program is an integral part of the broad-based statewide effort to combat air pollution in California, pursuant to Health and Safety Code Section 39700;

WHEREAS, the Air Resources Board has been directed to administer and coordinate all air pollution research funded, in whole or in part, with state funds, pursuant to Health and Safety Code Section 39703;

WHEREAS, the Air Resources Board has been directed to establish objectives for air pollution research in California, pursuant to Health and Safety Code Section 39703;

WHEREAS, the Air Resources Board has been directed to appoint a Research Screening Committee to give advice and recommendations with respect to all air pollution research projects funded by the state, pursuant to Health and Safety Code Section 39705;

WHEREAS, the Research Screening Committee has reviewed and approved a Long-Range Research Plan, dated March 1986, for air pollution research in California;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Sections 39703 and 39705, hereby concurs in the recommendation of the Research Screening Committee and approves the Long-Range Research Plan, dated March 1986, for air pollution research in California.

I hereby certify that the above is a true and correct copy of Resolution 86-26 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Resolution 86-27
April 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 105-16, entitled "Measurement of Organic Acids in the South Coast Air Basin," has been submitted by Daniel Grosjean and Associates, Inc. to the ARB; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 105-16, entitled "Measurement of Organic Acids in the South Coast Air Basin," submitted by Daniel Grosjean and Associates, Inc., for a total amount not to exceed $79,150.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 105-16, entitled "Measurement of Organic Acids in the South Coast Air Basin," submitted by Daniel Grosjean and Associates, Inc., for a total amount not to exceed $79,150.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $79,150.

I hereby certify that the above is a true and correct copy of Resolution 86-27, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (1)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 105-16 entitled "Measurement of Organic Acids in the South Coast Air Basin."

RECOMMENDATION: Adopt Resolution 86-27 approving Proposal No. 105-16 for funding in an amount not to exceed $79,150.

SUMMARY: The Kapiloff Acid Deposition Act requires the ARB to identify the contribution of pollution source types to acidic deposition and to study the chemical mechanisms of acid formation in the atmosphere. Previous measurements of Los Angeles rainfall samples have shown that the most abundant contaminant was organic carbon. In September 1985, dew chemistry measurements made at Pomona College also showed apparently significant amounts of organic acids.

The proposed study is to identify and quantify gas and particle phase organic acids in the Los Angeles atmosphere for a ten-day period in August 1986. The project will coincide with the ARB-sponsored Carbonaceous Species Methods Comparison Study (CSMCS), and will permit assessment of the relative abundance of organic acids in the Los Angeles aerosol during the CSMCS period. In addition, if dew formation occurs at the study site during the CSMCS, the abundance and influence of organic acids on dew chemistry will be assessed.

The study will be carried out by Daniel Grosjean and Associates with Dr. Grosjean as the principal investigator.

State of California
AIR RESOURCES BOARD

Resolution 86-28
April 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 106-16, entitled "Statewide Survey of Aquatic Ecosystem Chemistry," has been submitted by California Department of Fish and Game to the ARB; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 106-16, entitled "Statewide Survey of Aquatic Ecosystem Chemistry," submitted by California Department of Fish and Game for a total amount not to exceed $102,778.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 106-16, entitled "Statewide Survey of Aquatic Ecosystem Chemistry," submitted by California Department of Fish and Game for a total amount not to exceed $102,778.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $102,778.

I hereby certify that the above is a true and correct copy of Resolution 86-28, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (2)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 106-16 entitled "Statewide Survey of Aquatic Ecosystem Chemistry."

RECOMMENDATION: Adopt Resolution 86-28 approving Proposal No. 106-16 for funding in an amount not to exceed $102,778.

SUMMARY: This project would provide baseline data on the geographic extent of California lakes that are sensitive to acidic deposition. This research is a continuation of work that the California Department of Fish and Game (DFG) is currently doing for the ARB. DFG would sample 50 lakes distributed throughout California during the fall dry period of 1986. Water samples would be measured for conductivity, pH, alkalinity, sulfate, chloride, nitrate, phosphate, silica, calcium, magnesium, sodium, potassium, aluminum, iron, and manganese.

After the completion of the fall 1986 sampling, DFG would have data on fifty lakes for the springs of 1985 and 1986 and the falls of 1985 and 1986. This data should provide an indication of the year-to-year variability in alkalinity and other measures of lake water quality throughout the State. These data will be used to help develop a least-cost sampling approach for determining trends in surface water quality, as required by the Kapiloff Act.

The California Department of Fish and Game has successfully carried out this monitoring in the past through an interagency agreement with ARB. This proposal would continue that agreement for one more field season, after which a comprehensive analysis would be performed.

The principal investigator would be Dr. Kim McCleneghan.

BUDGET SUMMARY

California Department of Fish and Game

"Statewide Survey of Aquatic Ecosystem Chemistry"

BUDGET ITEMS:

Salaries	$37,758		
Benefits	11,407		
Supplies	3,600		
Other Costs	10,067		
Travel	10,000		
Equipment	500		
Data Analysis and Interpretation*	10,000		
TOTAL, Direct Costs			$83,332
TOTAL, Indirect Costs			19,446
		TOTAL PROJECT COST	$102,778

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* Scientific Advisory Committee approved up to an additional $10,000, if needed, for analysis and interpretation of data.

State of California
AIR RESOURCES BOARD

Resolution 86-29
April 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 107-16, entitled "Effects of Acid Fog on Airway Function in People with Asthma," has been submitted by the University of California, San Francisco to the Air Resources Board; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 107-16, entitled "Effects of Acid Fog and Airway Function in People with Asthma," submitted by the University of California, San Francisco for a total amount not to exceed $603,733.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 107-16, entitled "Effects of Acid Fog on Airway Function in People with Asthma," submitted by the University of California, San Francisco for a total amount not to exceed $603,733.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $603,733.

I hereby certify that the above is a true and correct copy of Resolution 86-29, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (3)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 107-16 entitled "Effects of Acid Fog on Airway Function in People with Asthma."

RECOMMENDATION: Adopt Resolution 86-29 approving Proposal No. 107-16 for funding in an amount not to exceed $603,733.

SUMMARY: In view of the findings of high acidity in fogs at California locations, the Scientific Advisory Committee has placed a high priority on determining what effects such fogs might have on humans. Because of the difficulty of producing simulated fogs for work in exposure chambers, the Committee advised that work should start by designing a feasible system for generating fog for exposure chambers. Another ARB contractor has now completed a comprehensive design study for generating, monitoring and controlling simulated acidic fog. The proponent for the current study, Dean Sheppard, M.D. of the University of California, San Francisco, has completed a study of effects of controlled acidic droplets of water delivered to asthmatic subjects by mouth piece.

About half the cost of the present proposal is to build and install the essential device, a prototype fog generator, in an existing exposure chamber, along with needed monitoring equipment. This major investment is needed because no facilities exist that are suitably equipped to allow the proposed work to be performed.

The other half of the cost would go to studying asthmatic subjects. In the first year the study would continue to use the mouth piece exposure. In the second year, the exposures would be carried out in the newly equipped chamber.

The investigators will explore the extent and nature of the respiratory response of asthmatics exposed to acidic fogs and aerosols. The major aim is to apportion the effects of using different acids, differing overall acidity, different anionic compositions, and differing osmolarities of fog droplets. This approach would begin to fill the very large gap in knowledge of the effects of acidic fogs on humans.

The principal investigator for this study is Dean Sheppard, M.D.

BUDGET SUMMARY

University of California, San Francisco

"Effects of Acid Fog on Airway Function in People with Asthma"

BUDGET ITEMS:

Salaries*	$146,688	
Benefits	36,131	
Supplies	18,952	
Other Costs	17,540	
Travel	3,708	
Equipment**	359,512	
TOTAL, Direct Costs		$582,531
TOTAL, Indirect Costs		21,202
TOTAL PROJECT COST		$603,733

* Includes payment to human subjects

** Acid Fog generator, delivery, monitoring and data aquisition devices. Includes labor to facilitate test and calibrate system. $355,262

Freezing point osmometer $ 4,250

State of California
AIR RESOURCES BOARD

Resolution 86-30
April 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 108-16, entitled "Acquisition of Acid Vapor and Aerosol Concentration Data for Use in Dry Deposition Studies in the South Coast Air Basin," has been submitted by California Institute of Technology to the ARB; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 108-16, entitled "Acquisition of Acid Vapor and Aerosol Concentration Data for Use in Dry Deposition Studies in the South Coast Air Basin," submitted by California Institute of Technology for a total amount not to exceed $87,839.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 108-16, entitled "Acquisition of Acid Vapor and Aerosol Concentration Data for Use in Dry Deposition Studies in the South Coast Air Basin," submitted by California Institute of Technology for a total amount not to exceed $87,839.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $87,839.

I hereby certify that the above is a true and correct copy of Resolution 86-30, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (4)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 108-16 entitled "Acquisition of Acid Vapor and Aerosol Concentration Data for Use in Dry Deposition Studies in the South Coast Air Basin."

RECOMMENDATION: Adopt Resolution 86-30 approving Proposal No. 108-16 for funding in an amount not to exceed $87,839.

SUMMARY:

California Institute of Technology is currently operating a dual purpose monitoring network of enhanced PM_{10} measurements for the South Coast Air Quality Management District (funded by the EPA), and acid gas/particle measurements for the ARB. The data from this network will be used to estimate dry deposition of acidic species and in determining its spatial and temporal variations in the SoCAB.

In order to ensure the highest quality for its data, and at the request of ARB staff, Caltech temporarily stopped work on the ARB monitoring network to participate in the South Coast nitric acid methods intercomparison study held in September 1985. Because of Caltech's participation, the starting date of the ARB monitoring network was delayed from August 1, 1985, to January 1, 1986. Accordingly, the schedules for the two parts of Caltech's network are out of phase by five months. Under this augmentation of the existing contract, Caltech would continue to operate the EPA/SCAQMD PM_{10} network from August 1, 1986 through January 1, 1987 under ARB funding. This would provide a full year of simultaneous data from both networks, thus allowing for an estimation of the annual flux of dry acid deposition for all major pollutant species. In addition, Caltech is requesting funding and a time extension to complete laboratory analysis of ARB network samples.

The Board's Scientific Advisory Committee requested the original modification of Caltech's monitoring schedule and recommends this augmentation to allow for the collection of one full year of monitoring data for both PM_{10} and acid gases/particles in the SCAB.

The principal investigator of this project is Glen Cass.

BUDGET SUMMARY

California Institute of Technology

"Acquisition of Acid Vapor and Aerosol Concentration Data for Use in Dry Deposition Studies in the South Coast Air Basin"

BUDGET ITEMS:

Salaries	$30,301		
Benefits	8,939		
Supplies	7,267		
Other Costs*	13,440		
Travel	2,120		
TOTAL, Direct Costs			$62,067
TOTAL, Indirect Costs			25,772
		TOTAL PROJECT COST	$87,839

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* Chemical analysis of samples.

State of California
AIR RESOURCES BOARD

Resolution 86-31
April 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 109-16, entitled "Analysis of Trace Metals in the Emerald Lake Watershed," has been submitted by the U.S. Geological Survey to the ARB; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 109-16, entitled "Analysis of Trace Metals in the Emerald Lake Watershed," submitted by the U.S. Geological Survey for a total amount not to exceed $8,892.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 109-16, entitled "Analysis of Trace Metals in the Emerald Lake Watershed," submitted by the U.S. Geological Survey for a total amount not to exceed $8,892.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $8,892.

I hereby certify that the above is a true and correct copy of Resolution 86-31, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (5)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 109-16 entitled "Analysis of Trace Metals in the Emerald Lake Watershed."

RECOMMENDATION: Adopt Resolution 86-31 approving Proposal No. 109-16 for funding in an amount not to exceed $8,892.

SUMMARY: This proposal would provide about five percent of the total cost of a major U.S. Geological Survey (USGS) study at Emerald Lake in Sequoia National Park.

The USGS, Water Resources Division, is planning to conduct a study of the occurrence, distribution and chemistry of trace elements (Cu, Cd, Pb, Zn, Cr, Ni and V) in deposition and surface waters in Sequoia National Park. Such a study is important in understanding the role of acid deposition in mobilizing toxic trace metals in sensitive ecosystems.

Dr. Howard Taylor of the USGS will be heading this field and laboratory effort. Most of the funding (approximately $180,000) will be provided by the USGS; the proponent has requested funding from the Air Resources Board for travel to the IWS.

BUDGET SUMMARY

U.S. Geological Survey

"Analysis of Trace Metals in the

Emerald Lake Watershed"

BUDGET ITEMS:

Salaries	$ -0-	
Benefits	-0-	
Supplies	-0-	
Other Costs	-0-	
Travel	7,800	
TOTAL, Direct Costs		$7,800
TOTAL, Indirect Costs		1,092
	TOTAL PROJECT COST	$8,892*

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* All other projects costs (estimated to be approximately $180,000) will be paid by the U.S. Geological Survey.

State of California
AIR RESOURCES BOARD

Resolution 86-32
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a solicited research proposal, Number 1397-125, entitled "A Study of the Efficacy of Aerosol vs. Non-Aerosol Laundry Products," has been submitted by American Research and Testing, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1397-125, entitled "A Study of the Efficacy of Aerosol vs. Non-Aerosol Laundry Products," submitted by American Research and Testing, Inc. for a total amount not to exceed $28,435.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1397-125, entitled "A Study of the Efficacy of Aerosol vs. Non-Aerosol Laundry Products," submitted by American Rsearch and Testing, Inc. for a total amount not to exceed $28,435.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $28,435.

I hereby certify that the above is a true and correct copy of Resolution 86-32, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (6)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1397-125 entitled "A Study of the Efficacy of Aerosol vs. Non-Aerosol Laundry Products."

RECOMMENDATION: Adopt Resolution 86-32 approving Proposal No. 1397-125 for funding in an amount not to exceed $28,435.

SUMMARY: Emissions of photochemically reactive organic compounds (PROC) from the use of aerosol laundry products are estimated to be approximately 6.6 tons per day statewide. Because non-aerosol laundry products contain no propellants and generally little or no PROC solvent, emissions from non-aerosol products are much lower.

The objective of this study is to determine whether it would be feasible, in terms of product efficacy and consumer satisfaction, to switch from aerosol to non-aerosol laundry products. This would be achieved by measuring the effectiveness of both aerosol and non-aerosol laundry products via a carefully conducted scientific study.

Two proposals were received in response to the ARB's Request for Proposals. The proposal from American Research and Testing, Inc. is recommended for funding by the Research Screening Committee and the staff.

American Research and Testing proposes to use Federal Test Method 191, "Stiffness of Cloth, Directional; Cantilever Bending Method," to assess spray starch effectiveness. Three brands, in up to three product forms, would be tested on three fabric types. Spot removers would be evaluated using daylight reflectance measurements and a visual evaluation. Up to three forms of each spot remover brand would be used on five fabrics with seven stains, both fresh and heat-set. Fabric blanks subjected to similar washings, using a standard detergent, would be used throughout.

State of California
AIR RESOURCES BOARD

Resolution 86-33
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1389-125, entitled "Southern California Air Quality Study - Program Management," has been submitted by Sonoma Technology, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1389-125, entitled "Southern California Air Quality Study - Program Management," submitted by Sonoma Technology, Inc. for a total amount not to exceed $247,137.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1389-125, entitled "Southern California Air Quality Study - Program Management," submitted by Sonoma Technology, Inc. for a total amount not to exceed $247,137.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $247,137.

I hereby certify that the above is a true and correct copy of Resolution 86-33, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (7)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1389-125 entitled "Southern California Air Quality Study - Program Management."

RECOMMENDATION: Adopt Resolution 86-33 approving Proposal No. 1389-125 for funding in an amount not to exceed $247,137.

SUMMARY: The Southern California Air Quality Study (SCAQS) is a multi-year, integrated air quality study whose overall goal is to develop a comprehensive and properly archived aerometric data base for the South Coast Air Basin (SoCAB). The data base will be used to test, evaluate and improve elements of air quality simulation models for oxidants, PM_{10}, fine particles, toxic air cointaminants and acidic species. The field portion of the study is scheduled to take place in the SoCAB during two comprehensive study periods in the summer and fall of 1987. The field study will be conducted primarily at existing air quality monitoring locations in the SoCAB.

Inasmuch as ten or more different sponsors for elements of the SCAQS program will be involved, close program coordination is critical to the success of the endeavor. This project will provide for management coordination for the first half of SCAQS and will involve three individuals: a Program Coordinator (PC), who will report directly to the ARB and will be responsible for overall project management; a Field Manager (FM), who will be responsible for the logistical aspects of the field sampling efforts; and an analysis coordinator (AC), who will identify the data analysis methodologies needed to meet program objectives. The PC, under the direction of the ARB project manager, will coordinate the efforts of the FM and AC to produce a clearly defined and scientifically defensible study.

Two proposals were received in response to the ARB's Request for Proposals. The proposal from Sonoma Technology, Inc. (STI) was recommended by the Research Screening Committee, external reviewers and the staff. The principal investigator would be Dr. Donald Blumenthal of STI. Co-investigators would be Dr. John Watson of the Desert Research Institute as Analysis Coordinator, and Dr. Susanne Hering of STI as Field Manager.

BUDGET SUMMARY

Sonoma Technology, Inc.

"Southern California Air Quality Study - Program Management"

BUDGET ITEMS:

Salaries	$58,327	
Benefits	13,997	
Supplies*	12,300	
Subcontract to Desert Research Institute	52,001	
Travel	8,025	
TOTAL, Direct Costs		$144,650
TOTAL, Indirect Costs		102,487
TOTAL PROJECT COST		$247,137

*Includes publication costs, duplication costs, meeting expenses and communications.

State of California
AIR RESOURCES BOARD

Resolution 86-34
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1390-125, entitled "A Study of Application Rates of Aerosol and Pump Hair Sprays," has been submitted by American Research and Testing, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1390-125, entitled "A Study of Application Rates of Aerosol and Pump Hair Sprays," submitted by American Research and Testing, Inc. for a total amount not to exceed $99,026.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1390-125, entitled "A Study of Application Rates of Aerosol and Pump Hair Sprays," submitted by American Research and Testing, Inc. for a total amount not to exceed $99,026.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $99,026.

I hereby certify that the above is a true and correct copy of Resolution 86-34, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (8)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1390-125 entitled "A Study of Application Rates of Aerosol and Pump Hair Sprays."

RECOMMENDATION: Adopt Resolution 86-34 approving Proposal No. 1390-125 for funding in an amount not to exceed $99,026.

SUMMARY: The use of certain aerosol consumer products, such as hair sprays, results in emissions of photochemically reactive organic compounds. Emissions from aerosol type hair sprays are estimated to release about 22 tons per day of reactive hydrocarbons statewide. Estimating the effects of candidate control measures, such as substitution of pump or other nonaerosol products, requires reliable data on application rates of the various dispensing systems. The purpose of this study is to obtain reliable information on application rates of selected aerosol, pump and bag-in-can spray products used by a carefully selected representative panel.

In the proposed American Research and Testing study, market research would be conducted with the cooperation of a selected panel of hair spray users. In addition, a comprehensive chemical analysis of propellants, solvents and resins would be conducted.

Data from this study would be used by the ARB staff to explore the feasibility and effectiveness of a suggested control measure for emissions from the use of aerosol hair spray products.

Five proposals were received in response to the RFP. The proposal received from American Research and Testing, Inc. was ranked highest by the Research Screening Committee and by the staff. The Principal Investigator would be Dr. Rita R. Boggs.

State of California
AIR RESOURCES BOARD

Resolution 86-35
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1400-125, entitled "Characterization of Exhaust Emissions from Trap-Equipped Light-Duty Diesels," has been submitted by Southwest Research Institute;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1400-125, entitled "Characterization of Exhaust Emissions from Trap-Equipped Light-Duty Diesels," submitted by Southwest Research Institute for a total amount not to exceed $249,954.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1400-125, entitled "Characterization of Exhaust Emissions from Trap-Equipped Light-Duty Diesels," submitted by Southwest Research Institute for a total amount not to exceed $249,954.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $249,954.

I hereby certify that the above is a true and correct copy of Resolution 86-35, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (9)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1400-125 entitled "Characterization of Exhaust Emissions from Trap-Equipped Light-Duty Diesels."

RECOMMENDATION: Adopt Resolution 86-35 approving Proposal No. 1400-125 for funding in an amount not to exceed $249,954.

SUMMARY:

Diesel-emitted particulate matter is respirable, contains mutagenic and carcinogenic substances, and absorbs light, thus contributing to visibility degradation in the atmosphere.

While the composition of particulate matter from uncontrolled diesels has been extensively studied, additional work is needed to determine the chemical characteristics of exhaust emissions from trap-equipped diesels in various modes of operation. This is particularly true of systems that use fuel additives to facilitate trap regeneration.

The objective of this project is to characterize thoroughly and to quantify the particulate and gaseous emissions from two different types of, trap-equipped, light-duty vehicles. One vehicle will be equipped with the catalyzed trap system used on 1985 and 1986 Mercedes-Benz passenger cars sold in California; the second vehicle will utilize an additive-regenerated trap. The Urban Dynamometer Driving Cycle, Highway Fuel Economy Test Cycle, and a low-speed will be used to conduct the emissions testing.

The information provided by this study will permit ARB and others to make more informed decisions in the future about particulate emission standards and fuel additives for diesel-powered vehicles.

This study would be performed by the Southwest Research Institute. The Principal Investigator would be Dr. Lawrence R. Smith.

BUDGET SUMMARY

Southwest Research Institute

"Characterization of Exhaust Emissions from Trap-Equipped Light-Duty Diesels"

BUDGET ITEMS:

Salaries	$65,576	
Benefits	24,919	
Supplies	9,976	
Other Costs*	15,606	
Travel	6,180	
TOTAL, Direct Costs		$122,257
TOTAL, Indirect Costs		127,697
TOTAL PROJECT COST		$249,954

* Includes vehicle lease and miscellaneous services.

State of California
AIR RESOURCES BOARD

Resolution 86-36
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1402-125, entitled "Interaction of Humidity with Air Pollutants on Vegetation," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1402-125, entitled "Interaction of Humidity with Air Pollutants on Vegetation," submitted by the University of California, Riverside for a total amount not to exceed $76,620.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1402-125, entitled "Interaction of Humidity with Air Pollutants on Vegetation," submitted by the University of California, Riverside for a total amount not to exceed $76,620.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $76,620.

I hereby certify that the above is a true and correct copy of Resolution 86-36, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (10)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1402-125 entitled "Interaction of Humidity with Air Pollutants on Vegetation."

RECOMMENDATION: Adopt Resolution 86-36 approving Proposal No. 1402-125 for funding in an amount not to exceed $76,620.

SUMMARY: Humidity is believed to be one of the most important environmental factors affecting the sensitivity of crops to air pollution. Marked differences in humidity among the important agricultural regions of California represent one important influence that makes it difficult to predict accurately the effects that a particular air pollutant may have on plants under ambient conditions in the field. The objective of this study is to determine how different levels of humidity affect the physiological and growth responses of plants exposed to ambient oxidants or sulfur dioxide. The investigators are Dr. C. R. Thompson and Dr. D. M. Olszyk.

The study will consist of three separate experiments: a summertime experiment with two levels of humidity and two levels of ambient oxidants, using tomatoes as the test species; a wintertime experiment with two levels of humidity and two levels of sulfur dioxide, using alfalfa, potatoes, onions, and wheat as test species; and a springtime experiment with two levels of humidity, two levels of ambient oxidants, and alfalfa as the test species. The investigators will measure photosynthesis, stomatal conductance, leaf water potential, leaf area, total plant growth, and yield. They will examine leaf samples microscopically and will evaluate visible injury over the course of the experiment. The investigators will analyze these data to clarify how differences in humidity affect plant response to air pollutant exposure.

It is important to understand how differences in growing conditions alter plant response to air pollution exposure. California presents a unique and varied assortment of growing conditions not found in other parts of the country. With information on how

differences in growing conditions, such as humidity, affect plant response to air pollution exposure, experimental results from one location could more easily be generalized to other locations. Information of this kind would greatly aid ARB's efforts to determine air pollution impacts on crops on a statewide basis through the program in crop loss assessment.

Successful completion of the study would also aid the standard setting process by providing a basis for using research results from more humid eastern states to develop and support air quality standards in California without the need to duplicate studies.

State of California
AIR RESOURCES BOARD

Resolution 86-37
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1387-125, entitled "The Role of Ozone Induced Lung Inflammation in Humans Varying Widely in Pulmonary Function Response," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1387-125, entitled "The Role of Ozone Induced Lung Inflammation in Humans Varying Widely in Pulmonary Function Response," submitted by the University of California, Davis, for a total amount not to exceed $157,268.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1387-125, entitled "The Role of Ozone Induced Lung Inflammation in Humans Varying Widely in Pulmonary Function Response," submitted by the University of California, Davis, for a total amount not to exceed $157,268.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $157,268.

I hereby certify that the above is a true and correct copy of Resolution 86-37, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (11)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1387-125 entitled "The Role of Ozone Induced Lung Inflammation in Humans Varying Widely in Pulmonary Function Response."

RECOMMENDATION: Adopt Resolution 86-37 approving Proposal No. 1387-125 for funding in an amount not to exceed $157,268.

SUMMARY: Previous studies of human pulmonary function have shown large individual variations in response to ozone. This study would investigate why some people appear to show substantial response to ozone at ambient concentrations while others do not.

The principal investigator, Dr. William Adams, of UC Davis has proposed to investigate the relationship between ozone-induced lung inflammation and pulmonary function impairment. An integrated study consisting of two parts is proposed to investigate this relationship. One part will study two groups of human subjects, one which is sensitive to the effects of ozone on pulmonary function and one which is rather insensitive to these effects. This part of the study would relate the results of pulmonary function tests to blood levels of substances associated with the inflammatory process. The other part of the study will use an animal model to investigate the relationship between lung inflammation and blood levels of the substances being measured in the human subjects and to further relate these measurements to ozone exposure.

A better understanding the issue of individual variability is important in setting ambient air quality standards. In order to protect sensitive individuals, it is necessary to find ways to identify them and to measure characteristics of their sensitivity. The work may also provide important information on the extent to which repeated exposures to ozone can produce long-term injury. This, of course, would have useful applications in designing and interpreting epidemiological field studies.

BUDGET SUMMARY

University of California, Davis

"The Role of Ozone Induced Lung Inflammation in Humans Varying Widely in Pulmonary Function Response"

BUDGET ITEMS:

Salaries*	$77,406	
Benefits	17,519	
Supplies	33,550	
Other Costs	2,950	
Travel	2,000	
Equipment**	10,500	
TOTAL, Direct Costs		$143,925
TOTAL, Indirect Costs		13,343
TOTAL PROJECT COST		$157,268

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* Includes payment to volunteer subjects

** Ozone generating and delivery system $1,000
Dasibi ozone monitor 3,500
Busco pulmonary function computer 6,000

State of California
AIR RESOURCES BOARD

Resolution 86-38
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1405-125, entitled "Nitrogen Dioxide Effects on Progression of Mouse Lymphoma/Leukemia, A Blood Cell Malignancy," has been submitted by the University of Southern California;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1405-125, entitled "Nitrogen Dioxide Effects on Progression of Mouse Lymphoma/Leukemia, A Blood Cell Malignancy," submitted by the University of Southern California for a total amount not to exceed $112,940.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1405-125, entitled "Nitrogen Dioxide Effects on Progression of Mouse Lymphoma/Leukemia, A Blood Cell Malignancy," submitted by the University of Southern California for a total amount not to exceed $112,940.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $112,940.

I hereby certify that the above is a true and correct copy of Resolution 86-38, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (12)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1405-125 entitled "Nitrogen Dioxide Effects on Progression of Mouse Lymphoma/Leukemia, A Blood Cell Malignancy."

RECOMMENDATION: Adopt Resolution 86-38 approving Proposal No. 1405-125 for funding in an amount not to exceed $112,940.

SUMMARY:

Recent research by the proponent and others has indicated that two common air pollutants, nitrogen dioxide and ozone, may play a role in the cause or progression of cancer in rodents. There is also new evidence for nitrogen dioxide that the occurence of cancer in exposed animals is linked to the suppression of the immune system, along with accompanying tissue changes. These results suggest a causal role for one of these pollutants, nitrogen dioxide, and cancer.

This proposal is to investigate the role of inhaled nitrogen dioxide in cancer causation. The proposed study would use a lymphoma/leukemia animal model that is much closer to the natural progress of a human cancer than previously used models.

Mice would be exposed to nitrogen dioxide at 0.25 ppm on an intermittent basis for 15 months, during which time groups of animals would be reviewed for study. The proposed study would also continue exploration of the effects of nitrogen dioxide inhalation on specific components of the immune system.

Positive finding from this study would provide substantial evidence linking ambient NO_2 exposure to human cancer. Taken with other evidence it could further substantiate the need to limit exposure to this common air pollutant.

Dr. Arnis Richters is the principal investigator for the project.

State of California
AIR RESOURCES BOARD

Resolution 86-39
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1404-125, entitled "A Demonstration of the Effects of Smog on Ornamental and Home Garden Plants," has been submitted by California Arboretum Foundation, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1404-125, entitled "A Demonstration of the Effects of Smog on Ornamental and Home Garden Plants," submitted by California Arboretum Foundation, Inc. for a total amount not to exceed $62,934.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1404-125, entitled "A Demonstration of the Effects of Smog on Ornamental and Home Garden Plants," submitted by California Arboretum Foundation, Inc. for a total amount not to exceed $62,934.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $62,934.

I hereby certify that the above is a true and correct copy of Resolution 86-39, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (13)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1404-125 entitled "A Demonstration of the Effects of Smog on Ornamental and Home Garden Plants."

RECOMMENDATION: Adopt Resolution 86-39 approving Proposal No. 1404-125 for funding in an amount not to exceed $62,934.

SUMMARY:

The vast majority of Californians are city dwellers whose main contact with vegetation is with ornamental and home garden plants. These plants improve the quality of the urban living environment and enhance the appearance and value of homes, businesses, and public buildings.

The objective of this project is to increase public awareness of the effects of air pollution on plants as well as to document the nature of injury on a wide range of plants through an experimental facility at the Los Angeles State and County Arboretum in Arcadia. The Director of the Arboretum, Mr. Francis Ching, would direct the work.

The facility would consist of a greenhouse divided into two parts. One part would receive ambient air, the other would receive carbon filtered air. The two parts of the greenhouse would contain duplicate plantings of ornamental and home garden plants that have been grown historically in the Los Angeles Basin. Visitors to the Arboretum would be permitted to view experiments in progress.

An information shelter would house materials explaining the display and the role of the individual citizen in improving air quality. ARB staff will work closely with the Arboretum staff in the preparation of explanatory materials. Arboretum staff would assess public response to the display and photograph the plants in the display to provide a pictorial record. The project is planned for three years.

A demonstration of this type would greatly enhance ARB's efforts to documment and to increase public awareness of the effects of air pollution on familiar ornamental species. The Los Angeles State and County Arboretum offers a unique combination of conditions advantageous for this type of project. The Arboretum receives from 3000-6000 visitors each week and is located in an area with some of the highest air pollution levels recorded in California. Arboretum staff are skilled in plant care and the preparation of displays about plants.

B U D G E T S U M M A R Y

California Arboretum Foundation, Inc.

"A Demonstration of the Effects of Smog on Ornamental and Home Garden Plants"

BUDGET ITEMS:

Salaries	$9,626	
Benefits	1,093	
Facilities*	51,957	
Other Costs	-0-	
Travel	-0-	
TOTAL, Direct Costs		$62,676
TOTAL, Indirect Costs		258
	TOTAL PROJECT COST	$62,934

* Greenhouse and support systems (including construction and installation) $48,207

Information shelter and display 2,500

Photographic and plant culture supplies and equipment 1,250

State of California
AIR RESOURCES BOARD

Resolution 86-40
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1406-125, entitled "Air Pollutant Effects on Nasal Function," has been submitted by the University of California, San Francisco;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1406-125, entitled "Air Pollutant Effects on Nasal Function," submitted by the University of California, San Francisco for a total amount not to exceed $113,784.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1406-125, entitled "Air Pollutant Effects on Nasal Function," submitted by the University of California, San Francisco for a total amount not to exceed $113,784.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $113,784.

I hereby certify that the above is a true and correct copy of Resolution 86-40, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (14)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1406-125 entitled "Air Pollutant Effects on Nasal Function."

RECOMMENDATION: Adopt Resolution 86-40 approving Proposal No. 1406-125 for funding in an amount not to exceed $113,784.

SUMMARY: The proposed work, submitted by Homer Boushey, M.D., is a departure from traditional respiratory function studies. The proponents would expose normal and sensitive human subjects to ozone or sulfur dioxide and would subsequently assess upper airway changes. The nasal chamber is very likely to be a sensitive target for the effects of inhaled air pollutants because its function in the protection of the respiratory tract makes it the site of greatest exposure to inhaled air pollutants. Nasal diseases are important childhood and adult illnesses and are known to be aggravated by irritants. However, few studies have been performed on the nasal response to air pollutants.

Upper airway changes will be monitored by direct measurements of nasal resistance, by nasal response to a provoking agent, and by cellular and biochemical changes in the nasal region. Subjects will include normal people, persons with allergic rhinitis, and persons with chronic rhinitis. Because the nasal airway is so accessible, results of this work may be useful not only in the clinical laboratory but may have future applications in epidemological studies on the effects of air pollution.

BUDGET SUMMARY

University of California, San Francisco

"Air Pollutant Effects on

Nasal Function"

BUDGET ITEMS:

Salaries*	$75,121		
Benefits	16,214		
Supplies	4,100		
Other Costs	3,750		
Travel	1,800		
Equipment**	2,700		
TOTAL, Direct Costs			$103,685
TOTAL, Indirect Costs			10,099
		TOTAL PROJECT COST	$113,784

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* Includes payment to volunteer subjects.

** Validyne amplifier $ 700

Graphico Video Display Terminal $2000

PROPOSED

State of California
AIR RESOURCES BOARD

Resolution 86-41

April 25, 1986

WHEREAS, Stanley P. Azen, Ph.D., has served with distinction as a member of the Air Resources Board's Scientific Review Panel on Toxic Air Contaminants from June 1984 to March 1986.

WHEREAS, his dedicated efforts, as well as those of his fellow charter members of the Scientific Review Panel, have greatly assisted the Board in the successful implementation of the Toxic Air Contaminant Program;

WHEREAS, Dr. Azen has exhibited the very finest attributes as a scientist and public official in carrying out his duties as a member of the Scientific Review Panel; and

WHEREAS, through his activities with the Scientific Review Panel he has contributed greatly toward improvements in public health in the State of California.

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board extends its deepest appreciation and thanks to Dr. Stanley P. Azen for his many contributions to environmental protection and the cause of clean air in California.

Jananne Sharpless, Chairwoman

George Bailey, Member

J. Gordon Kennedy, Member

Eugene Boston, M.D., Member

John S. Lagarias, Member

Roberta H. Hughan, Member

Harriett M. Wieder, Member

Betty S. Ichikawa, Member

Andrew Wortman, Ph.D., Member

State of California
AIR RESOURCES BOARD

Resolution 86-42

April 24, 1986

WHEREAS, Tirso del Junco has served with distinction as a member of the Air Resources Board (the "Board") from March 1983 through March 1986;

WHEREAS, as a publically involved citizen and prominent Los Angeles surgeon, he has outstanding medical, scientific, and leadership abilities which have enabled him to make valuable contributions to the activities of the Board;

WHEREAS, his acknowledged medical expertise has played an important role in the development of the Board's toxic air contaminant program and in furthering the Board's understanding of ambient air quality standards;

WHEREAS, in addition to his contributions at regular Board meetings, he has served as a member of the Board's H_2S Ambient Air Quality Standard Committee and Legislative Advisory Committee, and he has provided vital information and assistance to the Research Screening Committee;

WHEREAS, his intelligence, his attention to all facets of a problem, and his thorough grasp of issues have won for him the respect of his fellow Board members, the Board staff, and members of the public; and

WHEREAS, he will continue to serve the citizens of California as a member of the University of California Board of Regents.

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board extends its deepest appreciation to Dr. del Junco and expresses its thanks for his noteworthy contribution to California's progress towards clean air.

Jananne Sharpless, Chairwoman

George Bailey, Member

J. Gordon Kennedy, Member

Eugene Boston, M.D., Member

John S. Lagarias, Member

Roberta Hughan, Member

Harriett Wieder, Member

Betty S. Ichikawa, Member

Andrew Wortman, Ph.D., Member

State of California
AIR RESOURCES BOARD

Resolution 86 - 43

April 24, 1986

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in Section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in many parts of the state and, in Sections 39002 and 39003 of the Health and Safety Code, has charged the Air Resources Board with the responsibility for systematically attacking the serious air pollution problem caused by motor vehicles;

WHEREAS, Sections 43013, 43101 and 43104 of the Health and Safety Code authorize the Board to adopt emission standards and test procedures to control air pollution caused by motor vehicles;

WHEREAS, the Board has adopted "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," (Exhaust Test Procedures) incorporated by reference in Section 1960.1, Title 13, California Administrative Code;

WHEREAS, the Emission Test Procedures specify an exhaust emission standard of 0.4 grams per mile (g/mi) oxides of nitrogen (NOx) for passenger cars, light-duty trucks (0-3999 lbs.), and medium-duty vehicles (0-3999 lbs.) effective with the 1983 model year;

WHEREAS, in 1981, the Board was petitioned to reconsider the 0.4 g/mi NOx exhaust emission standard by several vehicle manufacturers which claimed that technical and financial considerations could prevent certain vehicles in their product line from meeting the 0.4 g/mi exhaust emission standard in 1983;

WHEREAS, in 1981, the Board adopted optional NOx exhaust emission standards of 0.7 g/mi for passenger cars and 1.0 g/mi for light-duty trucks (0-3999 lbs.) and medium-duty vehicles (0-3999 lbs.) effective for the 1983 and subsequent model years, accompanied by an extended liability for recall of vehicles with defective parts;

WHEREAS, Section 43101.5(b) of the Health and Safety Code requires the Board to submit a report to the Legislature by January 15, 1983, if the Board intends to consider eliminating the optional 0.7 g/mi NOx standard for passenger cars and 1.0 g/mi NOx standard for light-duty trucks and medium-duty vehicles of less than 4,000 lbs. for the 1986 and subsequent model years;

WHEREAS, on January 14, 1983, the Board submitted a report to the Legislature entitled: "Report to the Legislature on the Benefits and Feasibility of a 0.4 gram per mile Oxides of Nitrogen Exhaust Emission Standard for Passenger Cars and Light Trucks";

WHEREAS, the staff has proposed amendments to Section 1960.1.5, Title 13, California Administrative Code, which would restrict the use of the existing optional 0.7 g/mi NOx exhaust emission standard for passenger cars and replace the existing optional 1.0 g/mi NOx 50,000 mile exhaust emission standard for light-duty trucks (0-3999 lbs.) and medium-duty vehicles (0-3999 lbs.) with a limited 0.7 g/mi optional standard;

WHEREAS, the staff has proposed that affected vehicle manufacturers except small volume manufacturers be required to come into compliance with the amended standards over a period of two years beginning with the 1989 model year;

WHEREAS, the Staff has proposed amendments to Section 1960.1, Title 13, California Administrative Code, which would eliminate option 1 of the 100,000 mile emission standards for the 1989 and subsequent model-years, and restrict option 2 of the 100,000 mile emission standards to diesel-powered passenger cars, light-duty trucks (0-3999 lbs.), and medium-duty vehicles (0-3999 lbs.) for the 1989 and subsequent model-years;

WHEREAS, staff has proposed a delay of two years in the compliance schedule for any manufacturer which was subject to "in lieu" standards pursuant to Section 202(b)(1)(B) of the Federal Clean Air Act or which sells not more than 3,000 new motor vehicles per model year in California, i.e., small volume manufacturers;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available which would substantially reduce or avoid such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

> The primary exhaust emission standards of 0.39 g/mi non-methane hydrocarbons, 7.0 g/mi carbon monoxide, and 0.4 g/mi NOx for passenger cars and 0.39 g/mi non-methane hydrocarbons, 9.0 g/mi carbon monoxide, and 0.4 g/mi NOx for light-duty trucks and medium-duty vehicles are technologically feasible and cost effective for implementation in 1989 and 1990, except for passenger cars weighing more than 5000 pounds for which compliance with the 0.4 g/mi NOx standard will be technologically feasible and cost effective in 1994;

Staging full implementation of the 0.4 g/mi NOx standard over a period of five years will provide sufficient lead time to enable all affected vehicles to comply with the 0.4 g/mi NOx standard both for certification and in-use;

Some manufacturers may require additional time after initial implementation of the 0.4 g/mi NOx standard to evaluate the durability of emission control systems and make the required changes necessary to achieve 0.4 g/mi NOx in customer use;

Some small volume manufacturers of passenger cars, light-duty trucks, and medium-duty vehicles will require up to two additional years beyond 1989 to develop or buy the technology necessary to meet a 0.4 g/mi NOx emission standard;

Use of the optional 100,000 mile emission standards effective for gasoline-powered 1983 and subsequent model-year vehicles would seriously undermine the effectiveness of the staff's proposal to restrict use of the optional 0.7 g/mi NOx standard.

Retention of option 1 of the 100,000 mile emission standards effective for diesel-powered 1983 and subsequent model-year vehicles is unnecessary because option 1 was generally intended as a gasoline-powered vehicle standard and is not presently utilized to certify diesel-powered vehicles;

As a result of amending the NOx emission standard from 0.7 to 0.4 g/mi, the statutory limit to two years/24,000 miles on warranty coverage for designated emissions control system parts will no longer be operative for vehicles certified to the 0.4 g/mi standard;

WHEREAS, the Board further finds that:

The proposed amendments will result in significant adverse environmental impacts as follows: a slight increase in ozone levels in areas of relatively low ozone levels and a slight decrease in the current rate of reduction of vehicle benzene emissions;

The proposed amendments will result in significant reductions in emissions of NOx, hydrocarbon and carbon monoxide (CO), and concomitant reductions in ozone levels in areas of highest ozone concentrations, reduced CO levels, and reductions in particulate matter, nitrogen dioxide, visibility impairment, and acid deposition;

There are no feasible mitigation measures or alternatives available which would substantially reduce the significant adverse impacts while at the same time providing the substantial overall health benefit realized by the significant reductions described above.

NOW, THEREFORE BE IT RESOLVED, that the Board hereby approves the proposed amendments to Sections 1960.1 and 1960.1.5, Title 13, California Administrative Code as set forth in Attachment A hereto.

BE IT FURTHER RESOLVED, that the Board hereby approves amendments to the "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" as set forth in Attachment B hereto.

BE IT FURTHER RESOLVED THAT the Board directs the Executive Officer to adopt the amendments to Sections 1960.1 and 1960.1.5, Title 13, California Administrative Code, and the incorporated "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," as set forth in Attachments A and B, after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board directs staff to work with the California Automotive Task Force and other interested parties in developing appropriate legislation to reduce warranty coverage on tune-up parts for light-duty vehicles to two years or 24,000 miles whichever occurs first, consistent with preserving the air pollution benefits of the Board's motor vehicle emission control program.

BE IT FURTHER RESOLVED, that the Board hereby determines that the amendments approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards, will not cause the California requirements to be inconsistent with Section 202(a) of the Clean Air Act, and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to Section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall forward the amended regulations to the Environmental Protection Agency with a request for confirmation that the amendments are within the scope of an existing waiver, pursuant to Section 209(b)(1) of the Clean Air Act.

BE IT FURTHER RESOLVED that the staff is directed to take appropriate action to credit the emission reductions provided by this action to California's commitment to reasonable extra efforts to attain the national ambient air quality standards for ozone and carbon monoxide. Credits for nitrogen oxides

Attachment A

Amend Title 13, California Administrative Code, Section 1960.1 to read as follows:

1960.1. Exhaust Emission Standards and Test Procedures - 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

(a) Unchanged

(b) Unchanged

(c) Unchanged

(d) The exhaust emissions from new 1984 ~~and subsequent~~ through 1988 model passenger cars, light-duty trucks, and medium-duty vehicles and new 1984 through 1990 model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:

1984 THROUGH 1988 ~~1984~~ EXHAUST EMISSION STANDARDS (6)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.)(2)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)
PC	All	50,000	0.39(0.41)	7.0	0.4
PC (5)	All	50,000	0.39(0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39(0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.4
LDT,MDV (5)	0-3999	50,000	0.39(0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39(0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50(0.50)	9.0	1.0
LDT,MDV (Option 1)	4000-5999	100,000	0.50(0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60(0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60(0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(5) This set of standards for 1984 through 1988 ~~and later~~ model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1960.15.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year; and 0.2 g/mi for the 1986 through 1988 model years; ~~and 0.08 g/mi for the 1989 and subsequent model years~~. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(e) The exhaust emissions from new 1989 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles except those produced by a small volume manufacturer, and new 1991 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:

1989 AND SUBSEQUENT MODEL-YEAR EXHAUST EMISSION STANDARDS (6)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.)(2)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)(5)
PC	All	50,000	0.39(0.41)	7.0	0.4
PC(7)	All	50,000	0.39(0.41)	7.0	0.7
Diesel PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.4
LDT,MDV(7)	0-3999	50,000	0.39(0.41)	9.0	0.7 (8)
Diesel LDT,MDV(Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50(0.50)	9.0	1.0
LDT,MDV(Option 1)	4000-5999	100,000	0.50(0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60(0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60(0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(5) The standard for in-use compliance for passenger cars, light-duty trucks and medium-duty vehicles certifying to the 0.4 g/mi NOx standard shall be ~~0.7~~ 0.55 gm/mi NOx for 50,000 miles. If the in-use compliance level is above 0.4 gm/mi NOx but does not exceed 0.55 gm/mi NOx, and based on a review of information derived from a statistically valid and representative sample of vehicles, the Executive Officer determines that a substantial percentage of any class or category of such vehicles exhibits, prior to 50,000 miles or 5 years, whichever occurs first, an identifiable, systematic defect in a component listed in Section 1960.1.5(c)(2) which causes a significant increase in emissions above those exhibited by vehicles free of such defects and of the same class or category and having the same period of use and mileage, then the Executive Officer may invoke the enforcement authority under Sections 2112 and 2113, Title 13, California Administrative Code, to require remedial action by the vehicle manufacturer. Such remedial action shall be limited to owner notification and repair or replacement of the defective component. As used in this section, the term "defect" shall not include failures which are the result of abuse, neglect, or improper maintenance. This provision is applicable for the 1989 ~~and/1990~~ through 1993 model years only. For small volume manufacturers, this provision is applicable for the 1991 ~~and/1992~~ through 1995 model years only.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to a particulate exhaust emission standard of 0.08 gm/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(7) This set of standards is optional. A manufacturer may choose to certify to these standards pursuant to the conditions set forth in Section 1960.1.5.

(8) Pursuant to Section 1960.1.5(a)(1), the optional standard for 1989 model year light-duty trucks and medium-duty vehicles only is 1.0 gm/mi NOx.

~~(e)~~(f) The exhaust emissions from new 1981 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles certified to special standards authorized by Sections 1960.2, 1960.3, and 1960.4, Subchapter 1, Chapter 3, Title 13, California Administrative Code, subject to registration and sold and registered in this state, shall not exceed (1):

SPECIAL EXHAUST (10)
EMISSION STANDARDS
(grams per mile)

Year	Vehicle Type(2)	Equivalent Inertia Weight (lbs.)(3)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(4)	Carbon Monoxide	Oxides of Nitrogen (5)
1981	PC(6)	All	50,000	0.39(0.41)	7.0	1.5
	LDT,MDV (7)	0-3999	50,000	0.39(0.41)	9.0	1.5
1982(8)	PC	All	50,000	0.39(0.41)	7.0	1.0
1983(8)	PC	All	50,000	0.39(0.41)	7.0	0.7(9)
	LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	1.0
1984(8)	PC	All	50,000	0.39(0.41)	7.0	0.7
	LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.7(9)
1985(8)	LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.7

(1) Subsection ~~(e)~~ (f)shall remain in effect until December 31, 1990, and as of that date is repealed unless a later regulation deletes or extends that date. Notwithstanding the repeal or expiration of this regulation on December 31, 1990, the provisions of the regulation as they existed prior to such repeal or expiration shall continue to be operative and effective for those events occurring prior to the repeal or expiration.

(2) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(3) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(4) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(5) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be no greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(6) For vehicles certified to special standards authorized by Section 1960.2, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code.

(7) For vehicles certified to special standards authorized by Section 1960.3, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code.

(8) For vehicles certified to special standards authorized by Section 1960.4, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code. Special standards revert to "1983 and subsequent" standards for 1985 and subsequent passenger cars and 1986 and subsequent LDTs and MDVs.

(9) The Executive Officer may grant limited relief from the 1983 passenger car and 1984 LDT and MDV special NOx standard to a manufacturer who exceeds the standard because of unforeseen technical problems.

(10) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, 0.2 g/mi for the 1986 through 1988 model years, and 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

~~(f)~~ (g) For Option 1 the hydrocarbon and carbon monoxide compliance shall be determined on a 50,000 mile durability vehicle basis. For Option 2 the hydrocarbon and carbon monoxide compliance shall be determined on a 100,000 mile durability vehicle basis.

~~(g) For Options 1 and 2 the particulate compliance shall be determined on a 50,000 mile durability vehicle basis.~~

(h) The test procedures for determining compliance with these standards are set forth in "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles", adopted by the State Board on November 23, 1976, as last amended ~~October 2, 1985,~~ _____.

(i) With respect to any new vehicle required to comply with the standards set forth in paragraphs (a) through ~~(g)~~ (f), the manufacturer's written maintenance instructions for in-use vehicles shall not require scheduled maintenance more frequently than or beyond the scope of maintenance permitted under the test procedures referenced in paragraph (h) above. Any failure to perform scheduled maintenance shall not excuse an emissions violation unless the failure is related to or causative of the violation.

(j) Any 1982, 1983, and 1984 model year vehicle required to comply with the standards set forth in paragraphs (b), (c), (d), and ~~(e)~~ (f) which is subject to a standard set by federal law or regulation controlling emissions of particulate matter must conform to such standard.

(k) For purposes of this section and Section 1960.1.5, "small volume manufacturer" is any vehicle manufacturer which was subject to "in lieu" standards pursuant to Section 202(b)(1)(B) of the Federal Clean Air Act (42 U.S.C. Section 7521(b)(1)(B), as amended November 16, 1977) or a vehicle manufacturer with California sales not exceeding 3,000 new motor vehicles per model year based on previous model-year sales; however, for manufacturers certifying for the first time in California, model year sales shall be based on projected California sales.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43101 and 43104 Health and Safety Code, Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43101.5, 43102, 43104, 43106 and 43204, Health and Safety Code.

Amend Title 13, California Administrative Code, Section 1960.1.5, Subsection (a) to read as follows:

1960.1.5. Optional NOx Standard for 1983 and Later Model Passenger Cars, and Light-Duty Trucks and Medium-Duty Vehicles Less Than 4000 lbs. Equivalent Inertia Weight (EIW).

(a)(1) Notwithstanding any other provision of this chapter, a vehicle manufacturer may ~~choose to~~ certify 1983 and later model vehicles to optional NOx standards as follows:

(A) Passenger cars - 0.7 gm/mile - 1983 through 1988 ~~and subsequent~~ model years.
LDT, MDV 0-3999 pounds EIW - 1.0 gm/mile - 1983 through 1988 ~~and subsequent~~ model years.

(B) For the 1989 model year, each manufacturer may certify no more than 50 percent of its ~~combined~~ projected California model-year sales of passenger cars, light-duty trucks (0-3999 pounds EIW), and medium-duty vehicles (0-3999 pounds EIW) ~~engine families~~ to the optional NOx standard as follows:

Passenger cars - 0.7 gm/mi
LDT, MDV 0-3999 pounds EIW - 1.0 gm/mi

(C) 1989 ~~and subsequent~~ through 1993 model year passenger cars weighing more than 5000 pounds EIW may be certified to the 0.7 gm/mile NOx standard.

(D) For the 1990 ~~and later~~ through 1993 model years, a vehicle manufacturer may certify passenger cars, light-duty trucks (0-3999 lbs. EIW), and medium-duty vehicles (0-3999 lbs. EIW) to the optional 0.7 gm/mi NOx standard subject to the following limitations:

For each model year, the total number of passenger cars (0-5000 pounds EIW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of ~~8~~ 10 percent of the total previous California model-year sales of these vehicles.

For each model year, the total number of light-duty trucks (0-3999 pounds EIW) and medium-duty vehicles (0-3999 pounds EIW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of ~~8~~ 15 percent of the combined total previous California model-year sales of these vehicles.

For manufacturers certifying for the first time in California, "previous California model-year sales" shall mean projected California model-year sales.

(2) Notwithstanding any other provisions of this chapter, a small volume manufacturer may certify 1989 and later model vehicles to optional NOx standards as follows:

(A) Passenger cars - 0.7 gm/mile - 1989 and 1990 model years.

LDT, MDV 0-3999 pounds EIW - 1.0 gm/mile - 1989 and 1990 model years.

(B) For the 1991 model year, each small volume manufacturer may certify no more than 50 percent of its ~~combined~~ projected California model-year sales of passenger cars, light-duty trucks (0-3999 pounds EIW), and medium-duty vehicles (0-3999 pounds EIW) ~~engine families~~ to the optional NOx standards as follows:

Passenger cars - 0.7 gm/mile
LDT, MDV 0-3999 pounds EIW - 1.0 gm/mile

(C) For the 1992 ~~and later~~ through 1995 model years, each small volume manufacturer may certify passenger cars, light-duty trucks (0-3999 lbs. EIW), and medium-duty vehicles (0-3999 lbs. EIW) to the optional 0.7 gm/mi NOx standard subject to the following limitations:

For each model year, the total number of passenger cars (0-5000 pounds EIW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of ~~5~~ 10 percent of the total previous California model-year sales of these vehicles.

For each model year, the total number of light-duty trucks (0-3999 pounds EIW) and medium-duty vehicles (0-3999 pounds EIW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of ~~5~~ 15 percent of the combined total previous California model-year sales of these vehicles.

For manufacturers certifying for the first time in California, "previous California model-year sales" shall mean projected California model-year sales.

(b) Unchanged

(c) Unchanged

(d) Unchanged

Attachment B

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1981 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

Adopted: November 23, 1976
Adopted: December 14, 1976
Amended: May 26, 1977
Amended: June 8, 1977
Amended: June 22, 1977
Amended: September 20, 1977
Amended: January 15, 1978
Amended: March 1, 1978
Amended: April 10, 1978
Amended: May 24, 1978
Amended: February 9, 1979
Amended: May 22, 1979
Amended: March 5, 1980
Amended: March 26, 1980
Amended: August 27, 1980
Amended: August 28, 1980
Amended: December 2, 1980
Amended: May 20, 1981
Amended: October 27, 1981
Amended: November 19, 1981
Amended: July 1, 1982
Amended: August 26, 1982
Amended: March 9, 1983
Amended: January 5, 1984
Amended: October 2, 1985
Amended: _____

Amend California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-duty trucks, and medium-duty vehicles, Paragraph 4, Subsections (d), (e), and (f) to read as follows:

(d) The exhaust emissions from new 1984 ~~and subsequent~~ through 1988 model passenger cars, light-duty trucks, and medium-duty vehicles and new 1984 through 1990 model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:

1984 THROUGH 1988 ~~AND SUBSEQUENT~~ EXHAUST EMISSION STANDARDS (6)(7)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.)(2)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)
PC	All	50,000	0.39(0.41)	7.0	0.4
PC (5)	All	50,000	0.39(0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39(0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.4
LDT,MDV (5)	0-3999	50,000	0.39(0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39(0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50(0.50)	9.0	1.0
LDT,MDV (Option 1)	4000-5999	100,000	0.50(0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60(0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60(0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(5) This set of standards for 1984 through 1988 ~~and later~~ model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1960.15.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, and 0.2 g/mi for the 1986 through 1988 model years~~, and 0.08 g/mi for the 1989 and subsequent model years~~. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(7) For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

(e) The exhaust emissions from new 1989 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles except those produced by a small volume manufacturer, and new 1991 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:

1989 AND SUBSEQUENT MODEL YEAR EXHAUST EMISSION STANDARDS (6)~~(8)~~(7)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.)(2)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)(5)
PC	All	50,000	0.39(0.41)	7.0	0.4
PC~~(7)~~ (8)	All	50,000	0.39(0.41)	7.0	0.7
Diesel PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.4
LDT,MDV~~(7)~~(8)	0-3999	50,000	0.39(0.41)	9.0	0.7 (9)
Diesel LDT,MDV(Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50(0.50)	9.0	1.0
LDT,MDV(Option 1)	4000-5999	100,000	0.50(0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60(0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60(0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(5) The standard for in-use compliance for passenger cars, light-duty trucks and medium-duty vehicles certifying to the 0.4 g/mi NOx standard shall be ~~0.7~~ 0.55 gm/mi NOx for 50,000 miles. If the in-use compliance level is above 0.4 gm/mi NOx but does not exceed 0.55 gm/mi NOx, and based on a review of information derived from a statistically valid and representative sample of vehicles, the Executive Officer determines that a substantial percentage of any class or category of such vehicles exhibits, prior to 50,000 miles or 5 years, whichever occurs first, an identifiable, systematic defect in a component listed in Section 1960.1.5(c)(2) which causes a significant increase in emissions above those exhibited by vehicles free of such defects and of the same class or category and having the same period of use and mileage, then the Executive Officer may invoke the enforcement authority under Sections 2112 and 2113, Title 13, California Administrative Code, to require remedial action by the vehicle manufacturer. Such remedial action shall be limited to owner notification and repair or replacement of the defective component. As used in this section, the term "defect" shall not include failures which are the result of abuse, neglect, or improper maintenance. This provision is applicable for the 1989 ~~and/1990~~ through 1993 model years only. For small volume manufacturers, this provision is applicable to the 1991 ~~and/1992~~ through 1995 model years only.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to a particulate exhaust emission standard of 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(7) ~~This set of standards is optional. A manufacturer may choose to certify to these standards pursuant to the conditions set forth in Section 1960.1.5.~~

~~(8)~~ For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

(8) This set of standards is optional. A manufacturer may choose to certify to these standards pursuant to the conditions set forth in Section 1960.1.5.

(9) Pursuant to Section 1960.1.5(a)(1), the optional standard for 1989 model year light-duty trucks and medium-duty vehicles only is 1.0 gm/mi NOx.

~~(e)~~(f) The exhaust emissions from new 1981 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles certified to special standards authorized by Sections 1960.2, 1960.3, and 1960.4, Subchapter 1, Chapter 3, Title 13, California Administrative Code, subject to registration and sold and registered in this state, shall not exceed (1):

SPECIAL EXHAUST (10)(11)
EMISSION STANDARDS
(grams per mile)

Year	Vehicle Type(2)	Equivalent Inertia Weight (lbs.)(3)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(4)	Carbon Monoxide	Oxides of Nitrogen (5)
1981	PC(6)	All	50,000	0.39(0.41)	7.0	1.5
	LDT,MDV (7)	0-3999	50,000	0.39(0.41)	9.0	1.5
1982(8)	PC	All	50,000	0.39(0.41)	7.0	1.0
1983(8)	PC	All	50,000	0.39(0.41)	7.0	0.7(9)
	LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	1.0
1984(8)	PC	All	50,000	0.39(0.41)	7.0	0.7
	LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.7(9)
1985(8)	LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.7

(1) Subsection ~~(e)~~ (f)shall remain in effect until December 31, 1990, and as of that date is repealed unless a later regulation deletes or extends that date. Notwithstanding the repeal or expiration of this regulation on December 31, 1990, the provisions of the regulation as they existed prior to such repeal or expiration shall continue to be operative and effective for those events occurring prior to the repeal or expiration.

(2) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(3) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(4) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(5) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be no greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(6) For vehicles certified to special standards authorized by Section 1960.2, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code.

(7) For vehicles certified to special standards authorized by Section 1960.3, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code.

(8) For vehicles certified to special standards authorized by Section 1960.4, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code. Special standards revert to "1983 and subsequent" standards for 1985 and subsequent passenger cars and 1986 and subsequent LDTs and MDVs.

(9) The Executive Officer may grant limited relief from the 1983 passenger car and 1984 LDT and MDV special NOx standard to a manufacturer who exceeds the standard because of unforeseen technical problems.

(10) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, 0.2 g/mi for the 1986 through 1988 model years, and 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(11) For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 27, 1986

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-77
85-78
85-80
86-4
86-25
86-43
86-44
86-45

State of California
AIR RESOURCES BOARD

Resolution 86-44

April 25, 1986

Agenda Item No.: 86-5-2

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Sections 43013, 43101, and 43104 of the Health and Safety Code authorize the Board to adopt emission standards and test procedures to control air pollution caused by motor vehicles;

WHEREAS, Section 1956.7, Title 13, California Administrative Code, establishes exhaust emission standards and test procedures for 1982 and subsequent model heavy-duty gasoline-powered engines and vehicles (hereinafter the "Heavy-Duty Gasoline Standards and Test Procedures");

WHEREAS, the Heavy-Duty Gasoline Standards and Test Procedures incorporate a steady-state test procedure originally prescribed by the United States Environmental Protection Agency (EPA) to determine compliance with its heavy-duty emission standards for 1984 and earlier model years;

WHEREAS, in 1983 the EPA promulgated catalyst-forcing hydrocarbon (HC) and carbon monoxide (CO) emission standards of 1.1 and 14.4 grams per brake horsepower-hour (b/bhp-hr), respectively, for 1987 and subsequent model "light" heavy-duty gasoline engines up to 14,000 pounds gross vehicle weight rating (GVWR), and non-catalyst HC and CO emission standards of 1.9 and 37.1 g/bhp-hr, respectively, for 1987 and subsequent "heavy" heavy-duty gasoline engines greater than 14,000 pounds GVWR;

WHEREAS, in 1983 the EPA also amended its heavy-duty engine test procedures to include a new transient test cycle for gasoline engines, and changed the federal useful life period for heavy-duty gasoline engines to a new assigned "full-life useful-life" period of eight years/110,000 miles;

WHEREAS, in 1985 the EPA promulgated revised oxides of nitrogen (NOx) heavy-duty gasoline engine and vehicle emission standards of 10.6 g/bhp-hr for 1987 models, 6.0 g/bhp-hr for 1988 through 1990 models, and 5.0 g/bhp-hr for the 1991 and subsequent model years;

WHEREAS, the staff has proposed amendments to the Board's regulations which would generally align exhaust emission standards and test procedures for 1987 and subsequent model heavy-duty gasoline engines and vehicles with the corresponding federal standards and test procedures, adopt the federal full-life useful-life period for emissions compliance, engine durability and recall, allow a one-year carryover of the existing 1986 standards and test procedures to the 1987 model year for existing engines certified to the 1986 standards, and make related changes;

WHEREAS, the California Environmental Quality Act and Board regulations require that an action not be adopted as proposed where it will have significant adverse environmental impacts and alternatives or feasible mitigation measures to the proposed action are available which would substantially reduce such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

The standards and test procedures contained in the proposed amendments, including the catalyst-forcing standards for "light" heavy-duty gasoline engines, are technologically feasible and cost effective;

The proposed optional one-year carryover of the 1986 standards to the 1987 model year for existing engines certified to the 1986 standards is necessary to provide manufacturers who planned to use the steady-state standards for 1987 certification with lead time to comply with the transient cycle standards;

The proposed amendments set forth in Attachments A and B are consistent with the revised federal test procedures, and are appropriate to avoid unnecessary and costly additional testing by manufacturers and to ensure the continuation of the waiver of federal preemption under Clean Air Act Section 209;

Amending the defined useful-life period for California heavy-duty gasoline-powered engines and vehicles to be the same as the standardized federal full-life useful-life for purposes of emissions compliance, engine durability and recall will provide an incentive to build more durable emissions control systems;

The proposed amendments will result in significant emissions reductions of HC, CO and benzene commencing in 1987, and concomitant reductions in ozone, CO and benzene levels;

The 1991 and subsequent model year NOx standards in the proposed amendments will result in long-term NOx emissions reductions and concomitant reductions in ozone levels in the areas of highest ozone levels, and reductions in particulate matter, nitrogen dioxide, visibility impairment, and acid deposition;

The proposed amendments will result in a significant adverse environmental impact, in that NOx emissions from 1987-1990 model year engines will increase; this impact will be partially mitigated by the long-term NOx reductions stemming from the 1991 and subsequent model standards;

The HC, CO and benzene emissions reductions from 1987-1990 heavy-duty gasoline engines, when balanced with the NOx emissions increases from such vehicles, will result in an overall net health benefit; there are no feasible mitigation measures or alternatives available which would substantially reduce the adverse impact from the NOx emissions increase while maintaining the benefits of the HC, CO and benzene emissions reductions;

NOW, THEREFORE, BE IT RESOLVED that the Board hereby adopts the amendments to Sections 1956.7, 1956.8, 1965, and 2111, of Title 13, California Administrative Code, and the documents incorporated therein, as set forth in Attachments A and B hereto.

BE IT FURTHER RESOLVED that the Board hereby determines that the amendments approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards, will not cause the California requirements to be inconsistent with Section 202(a) of the Clean Air Act, and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to Section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall forward the amended regulation to the Environmental Protection Agency with a request either for confirmation that the amendments are within the scope of an existing waiver or for issuance of a new waiver, pursuant to Section 209(b)(1) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Board hereby directs the staff to evaluate further the need for and feasibility of more stringent standards for 1991 and later heavy-duty gasoline engines, and to report back to the Board with its recommendations as soon as feasible.

BE IT FURTHER RESOLVED that the staff is directed to take appropriate action to credit the emission reductions provided by this action to California's commitment to reasonable extra efforts to attain the national ambient air quality standards for ozone and carbon monoxide. Credits for nitrogen oxides are to be applied in the South Coast Air Basin, Ventura County, and other parts of the state for which it is shown that reductions in the emissions of nitrogen oxides will reduce ambient ozone concentrations.

I hereby certify that the above is a true and correct copy of Resolution 86-44, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

Amend Title 13, California Administrative Code, Section 1956.7, subsections (a) and (c) and section title to read as follows:[1/]

1956.7 Exhaust Emission Standards and Test Procedures - 1981 ~~and Subsequent~~ through 1986 Model Heavy-Duty Gasoline-Powered Engines and Vehicles and 1981 through 1984 Model Heavy-Duty Diesel-Powered Engines and Vehicles.

(a) The exhaust emissions from new 1981 ~~and subsequent~~ through 1986 model heavy-duty gasoline-powered engines and new 1981 through 1984 model heavy-duty diesel-powered engines, except engines used in medium-duty vehicles, shall not exceed:

Primary Exhaust Emission Standards
(grams per brake horsepower hour)

Model Year	Gasoline or Diesel-Powered	Hydrocarbons	Carbon Monoxide	Hydrocarbons plus Oxides of Nitrogen
1981-1983	Both	1.0	25	6.0
OR*	Both	-	25	5
1984	Both	0.5	25	4.5
~~1985 and subsequent~~ 1985-1986	Gasoline Only	0.5	25	4.5

* The two sets of standards for each model year are alternatives. A manufacturer has the option for each engine family of showing compliance with either set. Separate deterioration factors shall be established where applicable, for HC, CO, NOx and/or the combined emissions of HC and NOx.

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1. Sections 1956.7(b), (d), and (e) are not changed by the above proposal.

The following optional exhaust emission standards are applicable to engines tested pursuant to the optional federal test procedures and regulations for 1984 model heavy-duty engines. These standards replace the federal standards in Code of Federal Regulations Sections 86.084-10 and 86.084-11 for hydrocarbons, carbon monoxide and oxides of nitrogen only.**

Optional Exhaust Emission Standards
(grams per brake horsepower hour)

Model Year	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1984	1.3	15.5	5.1

** The federal 13-mode optional standards for 1984 model-year diesel-powered engines do not apply. In addition, the engine crankcase emission control requirement in Subparagraph 86.084-11(b)(2)(c) shall not apply for the 1984 model year.

(c) The test procedures for determining compliance with standards applicable to 1982 ~~and subsequent~~ through 1986 models are set forth in the "California Exhaust Emission Standards and Test Procedures for 1982 ~~and Subsequent~~ through 1986 Model Heavy-Duty Gasoline-Powered Engines and Vehicles and 1982 through 1984 Model Heavy-Duty Diesel-Powered Engines and Vehicles," adopted October 5, 1976, as last amended ~~April 8, 1985~~ _____.

NOTE: Authority cited: Section 39600 and 39601, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101 and 43104, Health and Safety Code.

Amend Title 13, California Administrative Code, Section 1956.8, to read as follows:[2/]

1956.8 Exhaust Emission Standards and Test Procedures--1985 and Subsequent Model Heavy-Duty Engines and Vehicles.

(a) The exhaust emissions from new 1985 and subsequent model heavy-duty diesel-powered engines, except engines used in medium-duty vehicles, shall not exceed:

Exhaust Emission Standards
(grams per brake horsepower-hour)

Model Year	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1985 and subsequent	1.3	15.5	5.1

(b) The test procedures for determining compliance with standards applicable to 1985 and subsequent heavy-duty diesel models are set forth in the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel-Powered Engines and Vehicles," adopted April 8, 1985.

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2. The Board is also scheduled to consider on April 24, 1986 separately noticed amendments to Section 1956.8(a) and (b), regarding heavy-duty diesel-powered engines and vehicles. Any amendments to those subsections would be included in the regulation.

(c) The exhaust emissions from new 1987 and subsequent model heavy-duty gasoline-powered engines, except engines used in medium-duty vehicles, shall not exceed:

Exhaust Emission Standards
(grams per brake horsepower-hour)

Model Year	Hydrocarbons	Carbon Monoxide[A]	Oxides of Nitrogen
1987[B]	1.1[C] 1.9[D]	14.4[C] 37.1[D]	10.6 10.6
1988-1990	1.1[C] 1.9[D]	14.4[C] 37.1[D]	6.0 6.0
1991 and Subsequent	1.1[C] 1.9[D]	14.4[C] 37.1[D]	5.0 5.0

A Carbon Monoxide emissions from engines utilizing exhaust aftertreatment technology shall also not exceed 0.5 percent of the exhaust gas flow at curb idle.

B Manufacturers with existing heavy-duty gasoline-powered engines certified to the California 1986 steady-state emission standards and test procedures may as an option certify those engines, for the 1987 model year only, in accordance with the standards and test procedures for 1986 heavy-duty gasoline-powered engines established in Section 1956.7.

C These standards are applicable to gasoline-powered engines intended for use in all heavy-duty vehicles.

D Applicable to heavy-duty gasoline-powered engines intended for use only in vehicles with a gross vehicle weight rating greater than 14,000 pounds. Also, as an option, a manufacturer may certify one or more gasoline-powered heavy-duty engine configurations intended for use in all heavy-duty vehicles to these emission standards, provided, that the total model year sales of such configuration(s) being certified to these emission standards represent no more than 5 percent of total model year sales of all gasoline-powered heavy-duty engines intended for use in vehicles with a Gross Vehicle Weight Rating of up to 14,000 pounds by the manufacturer.

(d) The test procedures for determining compliance with standards applicable to 1987 and subsequent heavy-duty gasoline-powered engines are set forth in the "California Exhaust Emission Standards and Test Procedures for 1987 and Subsequent Model Heavy-Duty Gasoline-Powered Engines and Vehicles," adopted _____.

~~(c)~~(e) A manufacturer may elect to certify heavy-duty ~~diesel~~ vehicles of less than 10,000 pounds maximum gross vehicle weight rating as medium-duty vehicles under Section 1960.1 of this chapter, in which event the heavy-duty emission standards and test procedures in this section shall not apply.

~~(d)~~(f)(1) In 1985 and future years, the executive officer may authorize use of engines certified to meet federal emission standards, or which are demonstrated to meet appropriate federal emission standards, in up to a total of 100 heavy-duty vehicles, including both gasoline- and diesel-powered heavy-duty vehicles, in any one calendar year when the executive officer has determined that no engine certified to meet California emission standards exists which is suitable for use in the vehicles.

(2) In order to qualify for an exemption, the vehicle manufacturer shall submit, in writing, to the executive officer the justification for such exemption. The exemption request shall show that, due to circumstances beyond the control of the vehicle manufacturer, California certified engines are unavailable for use in the vehicle. The request shall further show that redesign or discontinuation of the vehicle will result in extreme cost penalties and disruption of business. In evaluating a request for an exemption, the executive officer shall consider all relevant factors, including the number of individual vehicles covered by the request and the

anti-competitive effect, if any, of granting the request. If a request is denied, the executive officer shall state in writing the reasons for the denial.

(3) In the event the executive officer determines that an applicant may meet the criteria for an exemption under this subsection, but that granting the exemption will, together with previous exemptions granted, result in over 100 vehicles being permitted under this subsection to use non-California engines in heavy-duty vehicles in any one calendar year, the exemption may be granted only by the state board, under the criteria set forth herein.

NOTE: Authority cited: Section 39600 and 39601, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101 and 43104, Health and Safety Code.

Amend Title 13, California Administrative Code, Section 1965 to read as follows:

1965. Tune-Up Labels--1979 and Subsequent Model Year Motor Vehicles.

In addition to all other requirements, tune-up labels required by California certification procedures shall conform to the "California Motor Vehicle Tune-Up Label Specifications," adopted March 1, 1978, as last amended ~~April 8, 1985~~ _____.

NOTE: Authority cited: Sections 39600 and 39601, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43102, 43104, 43107 and 43200, Health and Safety Code.

Amend Title 13, California Administrative Code, Section 2111 to read as follows:

2111. In-Use Vehicle Emissions-Related Defects Reporting Procedures.

All 1978 and subsequent model-year passenger cars, light-duty trucks, medium- and heavy-duty vehicles, and motorcycles, certified for sale and registered in California, shall be subject to the "California Vehicle Emissions-Related Defects Reporting Procedures for 1978 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, Medium and Heavy-Duty Vehicles, and Motorcycles," adopted March 16, 1983, as amended ~~April 8, 1985~~ _____.

NOTE: Authority cited: Sections 39601, 43105 and 43213, Health and Safety Code. Reference: Sections 43000, 43105, 43106, and 43211-43213, Health and Safety Code.

State of California
AIR RESOURCES BOARD

PROPOSED

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1982 ~~-AND-SUBSEQUENT~~ THROUGH 1986 MODEL HEAVY-DUTY GASOLINE-POWERED ENGINES AND VEHICLES AND 1982 THROUGH 1984 MODEL HEAVY-DUTY DIESEL-POWERED ENGINES AND VEHICLES

Adopted: October 5, 1976
Amended: November 21, 1977
Amended: March 1, 1978
Amended: May 24, 1978
Amended: April 23, 1980
Amended: May 22, 1980
Amended: January 21, 1981
Amended: August 25, 1983
Amended: April 8, 1985
Amended: _____

Note: These procedures are printed in a style to indicate the proposed changes. New text is underlined and deleted portions are noted by strike out.

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1982 -AND-~~SUBSEQUENT~~ THROUGH 1986 MODEL HEAVY-DUTY GASOLINE-POWERED ENGINES AND VEHICLES AND 1982 THROUGH 1984 MODEL HEAVY-DUTY DIESEL-POWERED ENGINES AND VEHICLES

The provisions of Subparts A and D, Part 86, Title 40, Code of Federal Regulations, as they pertain to heavy-duty engines and vehicles, and as they existed on April 15, 1977, are hereby adopted as the primary California Exhaust Emission Standards and Test Procedures for 1982 ~~and Subsequent~~ Through 1986 Model Heavy-Duty Engines and Vehicles. For manufacturers that elect to certify heavy-duty engines pursuant to the federal transient cycle test procedures and regulations for the 1984 ~~and subsequent~~ model years, the provisions of Subparts A and N, Part 86, Code of Federal Regulations promulgated January 21, 1980, are hereby adopted as optional "California Exhaust Emission Test Procedures and Regulations for 1984 and Subsequent Model Heavy-Duty Engines and Vehicles." The federal procedures are applicable with the following exceptions and additions:

A. Subsection A of this procedure is applicable to new 1982 and subsequent model heavy-duty engines and vehicles tested pursuant to the primary and optional test procedures and standards.

1. A manufacturer may elect to certify heavy-duty vehicles of 10,000 pounds maximum gross vehicles weight rating or less as medium-duty vehicles, in which event heavy-duty standards and test procedures will not apply.

2. Definitions.

a. "Administrator" means the Executive Officer of the Air Resources Board.

b. "Certificate of Conformity" means "Executive Order" certifying vehicles for sale in California.

c. "Certification" means certification as defined in Section 39018 of the Health and Safety Code.

d. "Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.

e. "Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6,000 pounds, except passenger cars.

f. "Medium-duty vehicle" means any heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8500 pounds or less.

3. Any reference to vehicle or engine sales throughout the United States shall mean vehicle or engine sales in California.

4. Regulations concerning EPA hearings, EPA inspections, and specific language on the Certificate of Conformity, shall not be applicable to these procedures.

5. Labeling required pursuant to paragraph 86.079-35 for steady-state certification, labeling required pursuant to paragraph 86.084-35 for transient certification, and pursuant to Section 1965, Chapter 3, Title 13 of the California Administrative Code shall conform with the requirements specified in the "California Motor Vehicle Tune-Up Label Specifications".

6. Vehicle manufacturers shall affix a decal on each 1982 through 1984 model year production vehicle in accordance with Section 43200 of the California Health and Safety Code.

B. Subsection B of this procedure is applicable to the primary test procedures and standards for all heavy-duty engines and vehicles:

1. For gasoline and diesel-powered engines and vehicles:

   a. Durability data submitted pursuant to subparagraph 86.079-24(f) may be from engines previously certified by EPA or ARB.

   b. The requirement in subparagraph 86.079-28(b)(4)(i)(B) (durability engines must meet emission standards) shall refer to federal emission standards.

   c. A statement must be supplied that the production engines shall be in all material respects the same as those for which certification was granted.

   d. The average brake horsepower at each mode shall be reported for all emission tests.

   e. Engine manufacturers may apply durability and/or emission test data from 1979 and earlier model years towards certification for 1982 and subsequent models for similar engines, notwithstanding differences in the instrumentation. In the event that hydrocarbon emission data based on measurements from a nondispersive infrared analyzer are used pursuant to this section, such data shall be multiplied by a factor of 1.5 prior to comparison with the standards.

2. For gasoline-powered engines and vehicles only:

a. The mechanism for adjusting the idle air/fuel mixture, if any shall be designed so that either:

i. The mixture adjustment mechanism is not visible, even with the air cleaner removed, and special tools and/or procedures are required to make adjustments; or

ii. In the alternative, the Executive Officer may, upon reasonable notice to the manufacturer, require that a certification test of an engine or vehicle be conducted with the idle air/fuel mixture at any setting which the Executive Officer finds corresponds to settings likely to be encountered in actual use. The Executive Officer, in making this finding, shall consider the difficulty of making adjustments, damage to the carburetor in the event of any effort to make an improper adjustment, and the need to replace parts following the adjustment.

The manufacturer shall submit for approval by the Executive Officer the proposed method of compliance with this requirement in its preliminary application for certification.

The Executive Officer may, on a case-by-case basis, exempt from the requirements of this section engines which use carburetors substantially different in design from carburetors used on light or medium-duty vehicles and which the manufacturer demonstrates cannot be made to comply with this section within the available lead time. Such exemptions shall only apply to the 1982 model year.

b. A gasoline-powered vehicle manufacturer shall provide with the application:

i. Identification and description of the vehicle models for which certification is requested.

ii. Identification and description of the engines to be used in those vehicle models.

iii. Reference to the engine manufacturer's Executive Order certifying these engines.

c. If a gasoline-powered engine manufacturer requires the use of unleaded fuel for 1982 through 1984 model year engines, a statement will be required that the engine and transmission combinations for which certification is requested are designed to operate satisfactorily on a gasoline having a research octane number not greater than 91.

3. For diesel-powered heavy-duty engines only:

   a. No durability fleet or smoke emission test will be required and any reference to durability testing shall be optional. No deterioration factor shall be used for calculating the emission test results. The 125 hour test shall be used to determine compliance with the emission standards.

   b. Evidence must be submitted to the Executive Officer to demonstrate the durability of the emission control system. Such evidence may include durability test data and/or an engineering evaluation of the system. This evaluation shall be based on previous experience and/or similarity to previously certified systems.

C. Exhaust Emission Standards:

1. The following primary exhaust emission standards represent the maximum projected emissions from new heavy-duty gasoline engines and the maximum 125-hour test exhaust emissions from new heavy-duty diesel engines:

Primary Exhaust Emission Standards
(grams per brake horsepower hour)

Model Year	Gasoline or Diesel-Powered	Hydrocarbons	Carbon Monoxide	Hydrocarbons Plus Oxides of Nitrogen
1982 - 1983	Both	1.0	25	6.0
OR*	Both	-	25	5
1984	Both	0.5	25	4.5
~~1985 and subsequent~~ 1985-1986	Gasoline only	0.5	25	4.5

*The two sets of standards for each model year are alternatives. A manufacturer has the option for each engine family of showing compliance with either set.

Separate deterioration factors shall be established, where applicable, for HC, CO, NOx, and/or the combined emissions of HC and NOx.

2. The following optional exhaust emission standards are applicable pursuant to the federal test procedure and regulations for 1984 model heavy-duty engines. These standards replace the federal standards in CFR Sections 86.084-10, and 86.084-11 for hydrocarbons, carbon monoxide, and oxides of nitrogen, only.**

Optional Exhaust Emission Standards
(grams per brake-horsepower-hour)

Model Year	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen
1984	1.3	15.5	5.1

** The federal 13-mode optional standards for diesel-powered engines for 1984 only are not applicable to California. In addition, the engine crankcase emission control requirement in Subparagraph 86.084-11(b)(2)(c) shall not apply for the 1984 model year.

Proposed

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1987 AND SUBSEQUENT MODEL HEAVY-DUTY GASOLINE-POWERED ENGINES AND VEHICLES

Adopted: _____

NOTE: This is a new document proposed for adoption. It incorporates by reference various sections of the Code of Federal Regulations, some with modifications. All proposed language is underlined.

The procedures are printed in a style that identifies proposed terms which vary from the federal provisions. Proposed modifications to the federal regulations are indicated by strike-out for deleted terms and double-underline for new terms. New California provisions which would replace specific federal provisions are denoted by the words "DELETE" for the federal language and "REPLACE WITH" for the new California language. The symbols "*****" and "..." mean that the remainder of the federal text for a specific section, which is not shown in these procedures, has been included by reference. Federal regulation sections which are not listed have not been proposed as part of the procedures.

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1987 AND SUBSEQUENT MODEL HEAVY-DUTY GASOLINE-POWERED ENGINES AND VEHICLES

The following provisions of Subparts A, N, and P, Part 86, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency on the date listed, and only to the extent they pertain to the testing and compliance of exhaust emissions from heavy-duty gasoline-powered engines and vehicles, are adopted and incorporated herein by this reference as the California Exhaust Emission Standards and Test Procedures for 1987 and Subsequent Model Heavy-Duty Gasoline-Powered Engines and Vehicles, except as altered or replaced by the provisions set forth below.

The federal regulations contained in the subparts identified above which pertain to evaporative emissions and oxides of nitrogen emission averaging shall not be applicable to these procedures.

Subpart A, General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, 1977 and Later Model Year New Light-Duty Trucks, and for 1977 and Later Model Year New Heavy-Duty Engines.

§86.085-1 General Applicability. March 15, 1985.

* * * * *

(b) ...GVWR or less to the ~~light-duty-truck~~ medium-duty vehicle ...

* * * * *

(e) ... projected combined ~~U.S.~~ California sales of ~~light-duty-vehicles~~ passenger cars, light-duty trucks, medium-duty vehicles and heavy-duty engines in its product line are fewer than ~~10,000~~ 3000 units for the model...

* * * * *

§86.085-2 Definitions. November 16, 1983.

* * * * *

"Administrator" DELETE
REPLACE WITH:
"Administrator" means the Executive Officer of the Air Resources Board.

* * * * *

"Certificate of Conformity" DELETE
REPLACE WITH:
"Certificate of Conformity" means "Executive Order" certifying vehicles for sale in California.

"Certification" DELETE
REPLACE WITH:
"Certification" means certification as defined in Section 39018 of the Health and Safety Code.

* * * * *

"Heavy-Duty Engine" DELETE
REPLACE WITH:
"Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.
"Heavy-Duty Vehicle" DELETE
REPLACE WITH:
"Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6,000 pounds, except passenger cars.

* * * * *

"Medium-Duty Vehicle" means any heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8500 pounds or less.

* * * * *

§86.088-2 Definitions. March 15, 1985.

§86.091-2 Definitions. March 15, 1985.

§86.078-3 Abbreviations. January 21, 1980.

§86.084-4 Section numbering; construction. September 25, 1980.

§86.084-5 General Standards; increase in emissions; unsafe conditions. November 2, 1982.

§86.078-7 Maintenance of records; submittal of information; right of entry. November 2, 1982.

§86.087-10 Emission standards for 1987 and later model year gasoline-fueled heavy-duty engines and vehicles. November 16, 1983.

§86.088-10 Emission standards for 1988 and later model year gasoline-fueled heavy-duty engines and vehicles. March 15, 1985.

§86.091-10 Emission standards for 1991 and later model year gasoline-fueled heavy-duty engines and vehicles. March 15, 1985.

§86.080-12 Alternative certification procedures. April 17, 1980.

§86.084-14 Small-volume manufacturers certification procedures. January 31, 1985.

* * * * *

(b)(1) ... produced by manufacturers with U.S. California sales (for the model year in which certification is sought) of fewer than ~~10,000~~ 3,000 units (LDV PC, LDT, MDV, and HDE combined).

* * * * *

(c)(4) DELETE
REPLACE WITH:
(c)(4) The manufacturer shall include in its records all of the information that EPA requires in §86.084-21 of this subpart. This information will be considered part of the manufacturer's application for certification.

* * * * *

(c)(7)(i)(C) ... determines and prescribes based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience. However, ...

* * * * *

(c)(11)(ii)(D)(1)...We project the total U.S. California sales of vehicles (engines) subject to this subpart to be fewer than ~~10,000~~ 3,000 units.

* * * * *

(c)(13)(ii)...affect vehicle emissions. All running changes which do not adversely affect emissions or the emissions control system durability are deemed approved unless disapproved by the Executive Officer within 30 days of the implementation of the running change. This ...

* * * * *

§86.085-20 Incomplete vehicles, classification. January 12, 1983.

§86.087-21 Application for certification. November 16, 1983.

§86.088-21 Application for certification. March 15, 1985.

§86.091-21 Application for certification. March 15, 1985.

§86.085-22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges. August 30, 1985.

DELETE any reference to Selective Enforcement Audit.

§86.087-23 Required data. March 15, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

§86.088-23 Required data. July 19, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

§86.091-23 Required data. July 19, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

§86.085-24 Test vehicles and engines. January 31, 1985.

* * * * *

(e)(1)(i) DELETE
REPLACE WITH:
(e)(1)(i) a combined total of 3000 California passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty engines,
(e)(1)(ii) DELETE
(e)(1)(iii) DELETE
(e)(1)(iv) DELETE
(e)(1)(v) DELETE
(e)(1)(vi) DELETE
(e)(2)...total sales of fewer than ~~10,000~~ 3,000...

* * * * *

(f) ...submitted. Durability data submitted may be from engines previously certified by the EPA or the Air Resources Board.

* * * * *

§86.087-25 Maintenance. March 15, 1985.

§86.088-25 Maintenance. March 15, 1985.

§86.084-26 Mileage and service accumulation; emission measurements. October 19, 1983.

§86.085-27 Special test procedures. January 12, 1983.

§86.087-28 Compliance with emission standards. March 15, 1985.

§86.088-28 Compliance with emission standards. March 15, 1985.

§86.091-28 Compliance with emission standards. March 15, 1985.

§86.087-29 Testing by the Administrator. January 24, 1984.

§86.088-29 Testing by the Administrator. March 15, 1985.

§86.091-29 Testing by the Administrator. March 15, 1985.

§86.087-30 Certification. August 30, 1985.

§86.088-30 Certification. March 15, 1985.

§86.091-30 Certification. March 15, 1985.

§86.079-31 Separate certification. September 8, 1977.

§86.079-32 Addition of a vehicle or engine after certification. September 8, 1977.

§86.079-33 Changes to a vehicle or engine covered by certification. September 8, 1977.

§86.082-34 Alternative procedure for notification of additions and changes. November 2, 1982.

§86.087-35 Labeling. Labels shall comply with the requirements set forth in the "California Tune-Up Label Specifications", as last amended _____.

§86.085-37 Production vehicles and engines. January 12, 1983.

§86.087-38 Maintenance instructions. March 15, 1985.

§86.084-40 Automatic expiration of reporting and recordkeeping requirements. September 25, 1980.

Subpart N, Emission Regulations for New Gasoline- and Diesel-Fueled Heavy-Duty Engines; Gaseous Exhaust Test Procedures

§86.1301-84 Scope; applicability. November 16, 1983.

§86.1301-88 Scope; applicability. March 15, 1985.

§86.1302-84 Definitions. November 16, 1983.

§86.1303-84 Abbreviations. November 16, 1983.

§86.1304-84 Section numbering; construction. November 16, 1983.

§86.1305-84 Introduction; structure of subpart. November 16, 1983.

§86.1306-84 Equipment required and specifications; overview. November 16, 1983.

§86.1306-88 Equipment required and specifications; overview. March 15, 1985.

§86.1308-84 Dynamometer and engine equipment specifications. December 10, 1984.

§86.1309-84 Exhaust gas sampling system; gasoline-fueled engines. November 16, 1983.

§86.1311-84 Exhaust gas analytical system; CVS bag sample. November 16, 1983.

§86.1313-84 Fuel specifications. December 10, 1984.

§86.1314-84 Analytical gases. December 10, 1984.

§86.1316-84 Calibration; frequency and overview. December 10, 1984.

§86.1318-84 Engine dynamometer system calibrations. November 16, 1983.

§86.1319-84 CVS calibration. December 10, 1984.

§86.1321-84 Hydrocarbon analyzer calibration. December 10, 1984.

§86.1322-84 Carbon monoxide analyzer calibration. November 16, 1983.

§86.1323-84 Oxides of nitrogen analyzer calibration. December 10, 1984.

§86.1324-84 Carbon dioxide analyzer calibration. November 16, 1983.

§86.1326-84 Calibration of other equipment. November 16, 1983.

§86.1327-84 Engine dynamometer test procedures; overview. December 10, 1984.

§86.1327-88 Engine dynamometer test procedures; overview. March 15, 1985.

§86.1330-84 Test sequence, general requirements. November 16, 1983.

§86.1332-84 Engine mapping procedures. December 10, 1984.

§86.1333-84 Transient test cycle generation. November 16, 1983.

§86.1334-84 Pre-test engine and dynamometer preparation. December 10, 1984.

§86.1335-84 Optional forced cool-down procedure. December 10, 1984.

§86.1336-84 Engine starting and restarting. March 15, 1985.

§86.1337-84 Engine dynamometer test run. November 16, 1983.

§86.1337-88 Engine dynamometer test run. March 15, 1985.

§86.1338-84 Emission measurement accuracy. November 16, 1983.

§86.1340-84 Exhaust sample analysis. December 10, 1984.

§86.1341-84 Test cycle validation criteria. March 15, 1985.

§86.1342-84 Calculations; exhaust emissions. March 15, 1985.

§86.1344-84 Required information. November 16, 1983.

§86.1344-88 Required information. March 15, 1983.

Subpart P - Emission Regulations for New Gasoline-Fueled Heavy-Duty Engines and New Gasoline-Fueled Light-Duty Trucks; Idle Test Procedures

§86.1501-84 Scope, applicability. December 10, 1984.

§86.1502-84 Definitions. November 16, 1983.

§86.1503-84 Abbreviations. November 16, 1983.

§86.1504-84 Section numbering; construction. November 16, 1983.

§86.1505-84 Introduction; structure of subpart. November 16, 1983.

§86.1506-84 Equipment required and specifications; overview. November 16, 1983.

§86.1509-84 Exhaust gas sampling system. November 16, 1983.

§86.1511-84 Exhaust gas analysis system. November 16, 1983.

§86.1513-84 Fuel specifications. November 16, 1983.

§86.1514-84 Analytical gases. November 16, 1983.

§86.1516-84 Calibration; frequency and overview. November 16, 1983.

§86.1519-84 CVS calibration. November 16, 1983.

§86.1522-84 Carbon monoxide analyzer calibration. November 16, 1983.

§86.1524-84 Carbon dioxide analyzer calibration. November 16, 1983.

§86.1526-84 Calibration of other equipment. November 16, 1983.

§86.1527-84 Idle test procedure; overview. November 16, 1983.

§86.1530-84 Test sequence; general requirements. November 16, 1983.

§86.1537-84 Idle test run. November 16, 1983.

§86.1540-84 Idle exhaust sample analysis. November 16, 1983.

§86.1542-84 Information required. December 10, 1984.

§86.1544-84 Calculation; idle exhaust emissions. March 15, 1985.

Appendix I-Urban Dynamometer Schedules.

(f)(1) EPA Engine Dynamometer Schedule for Heavy-Duty Gasoline-Fueled Engines. December 10, 1984.

Additional Requirements

1. Any reference to vehicle or engine sales throughout the United States shall mean vehicle or engine sales in California.

2. Regulations concerning EPA hearings, EPA inspections, EPA Selective Enforcement Auditing and specific language on the Certificate of Conformity, shall not be applicable to these procedures.

State of California
AIR RESOURCES BOARD

California Motor Vehicle Tune-Up
Label Specifications

1. Purpose. The Air Resources Board recognizes that certain emissions-critical or emissions-related parts must be properly adjusted in order for vehicles and engines to meet the applicable emission standards. The purpose of these specifications is to require motor vehicle or motor vehicle engine manufacturers to affix a label on each production vehicle in order to provide the vehicle owner with information necessary for the proper adjustment of these parts.

2. Applicability. These specifications shall apply to each new 1979 and subsequent model-year passenger car, light-duty truck, medium-duty vehicle, heavy-duty gasoline-fueled engine, and heavy-duty diesel-fueled engine, and to each new 1982 and subsequent model year motorcycle sold or offered for sale in California. Any vehicles or classes of vehicles exempt from exhaust emission standards pursuant to Article 2, Chapter 3, Title 13 of the California Administrative Code shall also be exempt from the requirements of these specifications. The responsibility for compliance with these specifications shall rest with the motorcycle, light-duty vehicle, medium-duty vehicle, or heavy-duty engine manufacturer who certified such vehicles or engines.

3. Label Content and Location

   (a) A plastic or metal label shall be welded, riveted or otherwise permanently attached to an area within the engine compartment (if any) or to the engine in such a way that it will be readily visible to the average person after installation of the engine in a vehicle.

In selecting an acceptable location, the manufacturer shall consider the possibility of accidental damage (e.g., possibility of tools or sharp instruments coming in contact with the label). The label shall be affixed in such a manner that it cannot be removed without destroying or defacing the label, and shall not be affixed to any part which is likely to be replaced during the vehicle's useful life. For motorcycles, passenger cars, light-duty trucks, and medium-duty vehicles, the label shall not be affixed to any equipment which is easily detached from the vehicle.

(b) The label shall contain the following information lettered in the English language in block letters and numerals which shall be of a color that contrasts with the background of the label:

i. The label heading: "Emission Control Information."

ii. Full corporate name and trademark of the manufacturer.

iii Engine family identification, model designation (for heavy-duty diesels), and engine displacement (in cubic inches, cubic centimeters or liters).

iv. Exhaust Emission Control System: Initials may be used such as EM - engine modification, AI - air injection, FI - fuel injection.

v. Engine tune-up specifications and adjustments as recommended by the manufacturer, including but not limited to valve lash, ignition dwell, ignition timing, idle air fuel mixture setting procedure and valve (e.g., idle CO, idle speed drop), high idle speed, and, for diesels, initial injection timing, advertised horsepower, and fuel rate (in mm^3/stroke) at advertised horsepower (all as applicable). These

specifications shall indicate the proper transmission position during tune-up and what accessories, if any (e.g. air conditioner), should be in operation, and what systems, if any (e.g. vacuum advance, air pump), should be disconnected during the tune-up. For gasoline-fueled vehicles, the instructions for tune-up adjustments shall be sufficiently clear on the label so as to preclude the need for a mechanic or vehicle owner to refer to another document in order to correctly perform the adjustments.

vi. A vacuum hose routing diagram showing all emissions-related and emissions-critical parts that are actuated by vacuum and the correct routing of vacuum hoses. This diagram shall contain no more than two different vacuum hose routing patterns; however, if there are two routings on a single diagram each routing must be easily understandable. The hose diagram may be separated from the "Emission Control Information" label provided that the vacuum hose diagram is placed in a visible and accessible position.

vii. For motorcycles only, any specific fuel or engine lubricant requirements (e.g., lead content, research octane number, engine lubricant type).

viii. For heavy-duty engines, the date of engine manufacture (month and year).

ix. An unconditional statement of compliance with the appropriate model year California regulations; for example, "This vehicle (or engine, as applicable) conforms to California regulations applicable to _____ model year new _____ (specify

motorcycles, passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty gasoline engines, or heavy-duty diesel engines, as applicable)." For federally certified vehicles certified for sale in California the statement must include the phrase "conforms to federal regulations and is certified for sale in California". For Class III motorcycles for sale in California, the statement must include the phrase "is certified to HC engine family exhaust emission standard in California." For incomplete light-duty truck and incomplete medium-duty vehicles the label shall contain the following statement in lieu of the above:

"This vehicle conforms to California regulations applicable to _____ model-year new vehicles when completed at a maximum curb weight of ____ pounds and a maximum frontal area of _____ square feet."

x. For 1985 and subsequent model year heavy-duty diesel-powered engines and 1987 and subsequent model year heavy-duty gasoline-powered engines, if the manufacturer is provided an alternate useful life period under the provisions of 40 CFR 86.085-21(f), the prominent statement: "This vehicle has been certified to meet California standards for a useful life period of __ years or _____ miles of operation, whichever occurs first. This vehicle's actual life may vary depending on its service application." The manufacturer may alter this statement only to express the assigned alternate useful life in terms other than years or miles (e.g., hours, or miles only).

xi. For 1985 and subsequent model year heavy-duty diesel-powered engines, the prominent statement: "This engine has a primary intended service application as a _____ heavy-duty diesel-powered engine." (The primary intended service applications are light, medium, and heavy, as defined in 40 CFR 86.085-2.)

xii. For 1987 and subsequent model year heavy-duty gasoline-powered engines, one of the following prominent statements as applicable:

(1) For engines certified to the emission standards which are set forth in the table in Title 13, California Administrative Code, Section 1956.8(c) and are subject to footnote C of that table, the statement: "This engine is certified for use in all heavy-duty vehicles."

(2) For engines certified in accordance with the second sentence of footnote D of the table in Title 13, California Administrative Code, Section 1956.8(c), the statement, "This engine is certified for use in all heavy-duty vehicles. It is certified to the emission standards applicable to heavy-duty vehicles with a gross vehicle weight rating greater than 14,000 lbs."

(3) For engines certified in accordance with the first sentence of footnote D of the table in Title 13, California Administrative Code, Section 1956.8(c), the statement: "This engine is certified for use only in heavy-duty vehicles with a gross vehicle weight rating greater than 14,000 lbs."

Such statements shall not be used on labels placed on vehicles or engines which, in fact, do not comply with all applicable California regulations, including assembly-line test requirements, if any.

4. The provisions of these specifications shall not prevent a manufacturer from also reciting on the label that such vehicle or engine conforms to any applicable federal emission standards for new motor vehicles or new motor vehicle engines or any other information that such manufacturer deems necessary for, or useful to, the proper operation and satisfactory maintenance of the vehicle or engine.

5. As used in these specifications, readily visible to the average person shall mean that the label shall be readable from a distance of eighteen inches (46 centimeters) without any obstructions from vehicle or engine parts (including all manufacturer available optional equipment) except for flexible parts (e.g., vacuum hoses, ignition wires). Alternatively, information required by these specifications to be printed on the label shall be no smaller than 8 point type size provided that no vehicle or engine parts, (including all manufacturer available optional equipment), except for flexible parts, obstruct the label.

6. The label and any adhesives used shall be designed to withstand for the vehicle's total expected life, typical vehicle environmental conditions in the area where the label is attached. Typical vehicle environmental conditions shall include, but are not limited to, exposure to engine lubricants and coolants (e.g. gasoline, motor oil, brake fluids, water, ethylene glycol), underhood temperatures, steam cleaning, and paints or paint solvents. The manufacturer shall submit, with its certification application, a statement attesting that its labels comply with this requirement.

7. The manufacturer shall obtain approval from the Executive Officer for all label formats and locations prior to use. Approval of the specific tune-up settings is not required; however, the format for all such settings and tolerances, if any, is subject to review. If the Executive Officer finds that the information on the label is vague or subject to misinterpretation, or that the location does not comply with these specifications, he or she may require that the label or its location be modified accordingly.

8. Samples of all actual production labels used within an engine family shall be submitted to the Executive Officer within thirty days after the start of production.

9. (a) The Executive Officer may, upon request, waive or modify any part of the requirements of these specifications for the 1979 model year if a vehicle or engine manufacturer does not have adequate lead time to comply with the aforementioned requirements.

   (b) The Executive Officer may approve alternate label locations or may, upon request, waive or modify the label content requirements provided that the intent of these specifications are met.

PROPOSED

State of California
AIR RESOURCES BOARD

California Vehicle Emissions-Related Defects Reporting Procedures For 1978 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, Medium and Heavy-Duty Vehicles, and Motorcycles

Adopted: December 9, 1982
Amended: April 8, 1985
Amended: _____

NOTE: These procedures are printed in a style to indicate the proposed changes. New text is underlined, and deleted portions are noted by strike-out.

State of California
AIR RESOURCES BOARD

CALIFORNIA VEHICLE EMISSIONS-RELATED DEFECTS REPORTING PROCEDURES FOR 1978 AND SUBSEQUENT MODEL-YEAR PASSENGER CARS, LIGHT-DUTY TRUCKS, MEDIUM AND HEAVY-DUTY VEHICLES, AND MOTORCYCLES

A. GENERAL PROVISIONS

(1) These procedures shall apply to:

(a) California certified 1978 and subsequent model-year passenger cars, light-duty trucks, medium-duty and heavy-duty vehicles, and motorcycles.

(b) California certified motor vehicle engines used in such vehicles.

(2) The requirement to report emissions-related defects affecting a given class or category of vehicles or engines shall remain applicable for the useful life of the vehicles or engines.

(3) For the purposes of these procedures, the following definitions shall apply:

(a) "Useful Life" means:

(i) In the case of Class I motorcycles and motorcycle engines (50 to 169 cc or 3.1 to 10.4 cu. in.), a period of use of five years or 12,000 kilometers (7,456 miles), whichever first occurs.

(ii) In the case of Class II motorcycles and motorcycle engines (170 to 279 cc or 10.4 to 17.1 cu. in.), a period of use of five years or 18,000 kilometers (11,185 miles), whichever first occurs.

(iii) In the case of Class III motorcycles and motorcycle engines (280 cc and larger or 17.1 cu. in. and larger), a period of use of five years or 30,000 kilometers (18,641 miles), whichever first occurs.

(iv) In the case of 1978 through 1984 model year diesel-powered heavy-duty vehicles (except medium-duty vehicles), and 1978 through 1984 model year motor vehicle engines used in such vehicles, a period of use of five years, 100,000 miles, or 3000 hours of operation, whichever first occurs.

(v) In the case of 1978 through 1987 model year gasoline-powered heavy-duty vehicles (except medium-duty vehicles) certified using the steady-state emission standards and test procedures, and 1978 through 1987 model year heavy-duty motor vehicle engines certified using the steady-state emission standards and test procedures, a period of use of five years or 50,000 miles, whichever first occurs.

(vi) In the case of 1987 and subsequent model year gasoline-powered heavy-duty vehicles (except medium-duty vehicles) certified to the transient emission standards and test procedures, and 1987 and subsequent model year heavy-duty motor vehicle engines certified using the transient emission standards and test procedures, a period of use of eight years or 110,000 miles, whichever first occurs.

~~(v)~~(vii) In the case of 1985 and subsequent model year diesel-powered heavy-duty vehicles (except medium-duty vehicles), and 1985 and subsequent model year motor vehicle engines used in such vehicles, a period of use of eight years or 110,000 miles, whichever first occurs, for light, heavy-duty diesel-powered vehicles; eight years or 185,000 miles, whichever first occurs, for medium, heavy-duty diesel-powered vehicles; and eight years or 290,000 miles, whichever first occurs, for heavy, heavy-duty diesel-powered vehicles; or any alternative useful life period approved by the Executive Officer. (The classes of light, medium, and heavy, heavy-duty diesel-powered vehicles are defined in 40 CFR 86.085-2.)

~~(vi)~~(viii) In the case of light-duty and medium-duty vehicles certified under the Optional 100,000 Mile Certification Procedure, and motor vehicle engines used in such vehicles, a period of use of ten years or 100,000 miles, whichever first occurs.

~~(vii)~~(ix) In the case of all other light-duty~~,~~ and medium-duty ~~and heavy-duty~~ vehicles, and motor vehicle engines used in such vehicles, a period of use of five years or 50,000 miles, whichever first occurs. For those passenger cars, light-duty trucks and medium-duty vehicles certified pursuant to Title 13, California Administrative Code, Section 1960.15, the useful life shall be seven years, or 75,000 miles, whichever first occurs; however, the manufacturer's reporting and recall responsibility beyond 5 years or 50,000 miles shall be limited, as provided in Section 1960.15.

(b) "Emissions-Related Defect" shall mean a defect in design, materials, or workmanship in a device, system, or assembly described in the approved application for certification which affects any parameter, specification, or component enumerated in Appendix I. Excepted are defects in devices, systems and assemblies which the Executive Officer has deleted from the manufacturer's list of warranted parts pursuant to Section 2036(f), Title 13, California Administrative Code.

(c) Quarterly reports shall refer to the following calendar periods: January 1 - March 31, April 1 -June 30, July 1 -September 30, October 1 -December 31.

(d) "Days" shall mean normal working days when computing any period of time, unless otherwise noted.

(e) "Vehicle or engine manufacturer" means the manufacturer granted certification for a motor vehicle or motor vehicle engine. In the case of motor vehicles for which certification of the exhaust and evaporative emission control systems is granted to different manufacturers, the defect reporting responsibility shall be assigned accordingly.

(f) "Voluntary Emissions Recall" shall mean an inspection, repair, adjustment, or modification program voluntarily initiated and conducted by a manufacturer to remedy any emissions-related defect or nonconformity for which direct notification of vehicle or engine owners has been provided.

(g) "Ordered Emissions Recall" shall mean an inspection, repair, adjustment, or modification program required by the Board and conducted by the manufacturer to remedy any emissions-related defect or nonconformity for which direct notification of vehicle or engine owners has been provided.

(h) "Ultimate purchaser" shall be defined as provided in Section 39055.5 of the Health and Safety Code.

B. DEFECT INFORMATION REPORTS

(1) A manufacturer shall file a defect information report whenever:

(a) On the basis of data obtained subsequent to the effective date of these regulations, the manufacturer determines in accordance with procedures established by the manufacturer to identify safety-related defects (pursuant to 15 U.S.C. 1381 et seq., as amended) that a specific emissions-related defect exists in twenty-five or more vehicles or engines of the same model year; or

(b) The Executive Officer, with cause, requests such report, irrespective of when the defects were detected.

(2) No report shall be filed under these procedures for any emissions-related defect corrected prior to the sale of the affected vehicles or engines to an ultimate purchaser.

(3) Defect information reports required under subsection B.(1)(a) of these procedures shall be submitted not more than 15 working days after an emissions-related defect is found to affect twenty-five vehicles or engines of the same model year. Defect information reports requested under subsection B.(1)(b) of these procedures shall be submitted not more that 30 working days after the request is received. Items of information required by subsection B (4) of these procedures that are either not available within that period or are significantly revised shall be submitted as they become available.

(4) Except as provided in subsection B (3) of these procedures, each defect report shall contain the following information in substantially the format outlined below:

(a) The manufacturer's corporate name.

(b) A description of the defect.

(c) A description of each class or category of vehicles or engines potentially affected by the defect including make, model, model year, and such other information as may be required to identify the vehicles or engines affected.

(d) For each class or category of vehicle or engine described in response to subsection B (4)(c) of these procedures, the following shall also be provided:

(i) The number of vehicles or engines known or estimated to have the defect and an explanation of the means by which this number was determined.

(ii) The address of the plant(s) at which the potentially defective vehicles or engines were produced.

(e) An evaluation of the emissions impact of the defect and a description of any driveability problems which a defective vehicle might exhibit.

(f) Available emissions data which relate to the defect.

(g) An indication of any anticipated manufacturer follow-up.

C. VOLUNTARY EMISSIONS-RELATED RECALL

(1) When any manufacturer initiates a voluntary emissions recall campaign involving twenty-five or more vehicles or engines, the manufacturer shall submit a report describing the manufacturer's voluntary emissions recall plan as prescribed by these procedures within 15 working days of the date owner notification was begun. The report shall contain the following:

(a) A description of each class or category of vehicle or engine recalled including the number of vehicles to be recalled, the model year, the make, the model, and such other information as may be required to identify the vehicles or engines recalled.

(b) A description of the specific modifications, alterations, repairs, corrections, adjustments, or other changes to be made to correct the vehicles or engines affected by the emissions-related defect.

(c) A description of the method by which the manufacturer will determine the names and addresses of vehicle or engine owners and the method by which they will be notified.

(d) A description of the procedure to be followed by vehicle or engine owners to obtain correction of the nonconformity. This shall include designation of the date on or after which the owner can have the nonconformity remedied, the time reasonably necessary to perform the labor to remedy the defect, and the designation of facilities at which the defect can be remedied.

(e) If some or all of the nonconforming vehicles or engines are to be remedied by persons other than dealers or authorized warranty agents of the manufacturer, a description of the class of persons other than dealers and authorized warranty agents of the manufacturer who will remedy the defect.

(f) Three copies of the letters of notification to be sent to vehicle or engine owners.

(g) A description of the system by which the manufacturer will assure that an adequate supply of parts will be available to perform the repair under the remedial plan including the date by which an adequate supply of parts will be available to initiate the repair campaign, the percentage of the total parts requirement of each person who is to perform the repair under the remedial plan to be shipped to initiate the campaign, and the method to be used to assure the supply remains both adequate and responsive to owner demand.

(h) Three copies of all necessary instructions to be sent to those persons who are to perform the repair under the remedial plan.

(i) A description of the impact of the proposed changes on fuel consumption, driveability, and safety of each class or category of vehicles or engines to be recalled.

(2) The manufacturer shall not condition eligibility for repair on the proper maintenance or use of the vehicle except for strong and compelling reasons and with the approval of the Executive Officer; however, the manufacturer shall not be obligated to repair a component which has been removed or altered so that the remedial action cannot be performed without additional cost.

(3) The manufacturer shall require those who perform the repair under the voluntary recall to affix a label to each vehicle or engine repaired, or, when required, inspected under the voluntary recall.

(a) The label shall be placed in such location as aproved by the Executive Officer consistent with State law and shall be fabricated of a material suitable for the location in which it is installed and which is not readily removable intact.

(b) The label shall contain:

(i) the voluntary recall campaign number; and

(ii) A code designating the campaign facility at which the repair, or inspection for repair, was performed.

(4) The notification of vehicle or engine owners shall contain the following statement, "Your (vehicle or engine) (is or may be) releasing air pollutants which exceed (California or California and Federal) standards".

(5) Unless otherwise specified by the Executive Officer, the manufacturer shall report on the progress of the voluntary recall campaign by submitting subsequent reports for six consecutive quarters commencing with the quarter after the voluntary emissions recall campaign actually begins. Such reports shall be submitted no later than 25 working days after the close of each

calendar quarter. For each class or category of vehicle or engine subject to the voluntary emissions recall campaign, the quarterly report shall contain the:

(a) Emissions recall campaign number designated by the manufacturer.

(b) Date owner notification was begun, and date completed.

(c) Number of vehicles or engines involved in the voluntary emissions recall campaign.

(d) Number of vehicles or engines known or estimated to be affected by the emissions-related defect and an explanation of the means by which this number was determined.

(e) Number of vehicles or engines inspected pursuant to the voluntary emissions recall plan.

(f) Number of inspected vehicles found to be affected by the emissions-related defect.

(g) Number of vehicles actually receiving repair under the remedial plan.

(h) Number of vehicles determined to be unavailable for inspection or repair under the remedial plan due to exportation, theft, scrapping, or for other reasons (specify).

(i) Number of vehicles or engines determined to be ineligible for remedial action due to removed or altered components.

(j) Three copies of any service bulletins transmitted to dealers which relate to the defect to be corrected and which have not previously been reported.

(k) Three copies of all communications transmitted to vehicle or engine owners which relate to the defect to be corrected and which have not previously been submitted.

(6) If the manufacturer determines that any of the information requested in B (4) of these procedures has changed or was incorrect, revised information and an explanatory note shall be submitted. Answers to paragraphs C (5) (c), (d), (e), (f), (g), (h), and (i) of these procedures shall be cumulative totals.

(7) The manufacturer shall maintain in a form suitable for inspection, such as computer information storage devices or card files, the names and addresses of vehicle or engine owners:

(a) To whom notification was given;

(b) Who received remedial repair or inspection under the remedial plan; and

(c) Who were determined not to qualify for such remedial action when eligibility is denied due to removed or altered components.

(8) The records described in subsection C (7) of these procedures shall be made available to the Executive Officer or his or her authorized representative upon request.

(9) The reports required by these procedures shall be sent to: Chief, Mobile Source ~~Control~~ Division, 9528 Telstar Avenue, El Monte, California 91731.

(10) The information gathered by the manufacturer to compile the reports required by these procedures shall be retained for not less than one year beyond the useful life of the vehicles or engines and shall be made available to authorized personnel of the Air Resources Board upon request.

(11) The filing of any report under the provisions of these procedures shall not affect a manufacturer's responsibility to file reports or applications, obtain approval, or give notice under any provisions of law.

(12) The act of filing an Emissions Defect Information Report pursuant to these procedures is inconclusive as to the existence of a defect subject to Section 43204 of the Health and Safety Code and its implementing regulations. A manufacturer may include on each page of its Emissions Defect Information Report a disclaimer stating that the filing of a Defect Information Report pursuant to these regulations is not conclusive as to the applicability of Section 43204 of the Health and Safety Code and its implementing regulations.

State of California

86-44

Memorandum

To : Harold Holmes
Board Secretary

Date : July 21, 1986

Subject : Nonsubstantial Modification to April 25, 1986 Amendments to Title 13, California Administrative Code, Section 1956.8

From : James D. Boyd
Executive Officer
Air Resources Board

This is to memorialize that I have made a nonsubstantial modification to the April 25, 1986 amendments to Title 13, California Administrative Code, Section 1956.8.

As a minor aspect of broader comments regarding the standards applicable to heavy-duty trucks certified as medium-duty vehicles, General Motors (GM) recommended that the provisions allowing medium-duty vehicle certification of trucks "less than 10,000 pounds" gross vehicle weight rating (GVWR) should be expanded to cover trucks "not exceeding 10,000 pounds" GVWR. GM indicated that the change would enable a manufacturer to certify a heavy-duty truck to the medium-duty standard and simultaneously call it a 10,000-pound truck rather than a 9,999-pound truck.

Following the April 24, 1986 Board hearing, the staff compared the "less than 10,000 pounds" GVWR language in present Section 1956.8(c) to the analogous language in the United States Environmental Protection Agency (EPA) regulations, 40 CFR Section 86.085-1(b). The EPA regulation is among those incorporated by reference by the Board's test procedures. 40 CFR Section 86.085-1(b) permits light-duty truck certification of heavy-duty vehicles "10,000 pounds GVWR or less."

I have concluded that, particularly in light of the overall goal of the regulatory package to align more closely the California regulations with the federal regulations, it is appropriate for the ARB regulations to define the weight categories of heavy-duty trucks eligible for treatment as medium-duty vehicles in the same manner as the EPA regulations. The existing slight divergence appears to have resulted from a drafting oversight. Therefore, I have made a nonsubstantial change to Title 13, California Administrative Code, Section 1956.8(e) as amended to provide that medium-duty vehicle certification is permitted for trucks of "10,000 pounds or less" maximum GVWR.

cc: Board Members

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 27, 1986

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-77
85-78
85-80
86-4
86-25
86-43
86-44
86-45

State of California
AIR RESOURCES BOARD

Resolution 86-45

April 25, 1986

Agenda Item No.: 86-5-3

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Sections 43013, 43101, and 43104 of the Health and Safety Code authorize the Board to adopt emissions standards and test procedures to control air pollution caused by motor vehicles;

WHEREAS, following an August 23, 1984 hearing, the Board adopted Section 1956.8, Title 13, California Administrative Code, which established exhaust emission standards and test procedures for 1985 and subsequent model heavy-duty diesel-powered engines and vehicles (the "Heavy-Duty Diesel Standards and Test Procedures");

WHEREAS, the Heavy-Duty Diesel Standards and Test Procedures generally incorporate the transient cycle test procedures established by the United States Environmental Protection Agency (EPA), include an exhaust emission standard of 5.1 grams per brake horsepower hour (g/bhp-hr) for oxides of nitrogen (NOx), and do not contain an exhaust emission standard for particulate (PM);

WHEREAS, in 1985 the EPA amended the federal exhaust emission standards for 1988 and subsequent model heavy-duty diesel-powered engines and vehicles to include standards for PM of 0.60 g/bhp-hr for 1988-1990 models, 0.25 g/bhp-hr for 1991-1993 models other than urban bus engines, 0.10 g/bhp-hr for 1991-1993 model urban bus engines, and 0.10 g/bhp-hr for the 1994 and later model years;

WHEREAS, the 1985 EPA amendments also established heavy-duty diesel NOx emission standards of 6.0 g/bhp-hr for 1988-1990 models and 5.0 g/bhp-hr for 1991 and subsequent models, and allowed emission averaging for both the PM and NOx standards for the 1991 and later model years;

WHEREAS, the staff has proposed amendments to the Heavy-Duty Diesel Standards and Test Procedures which would establish PM and NOx emission standards for the 1988 and subsequent model years reflecting the corresponding federal PM and NOx standards;

WHEREAS, the amendments proposed by staff would also contain an option for certifying to the 1988 PM and NOx standards one year early in 1987, permit particulate but not NOx averaging starting with the 1991 model year, incorporate the federal smoke and opacity standards, and incorporate recent changes to the federal test procedures;

WHEREAS, the California Environmental Quality Act and Board regulations require that an action not be adopted as proposed where it will have significant adverse environmental impacts and alternatives or feasible mitigation measures to the proposed action are available which would substantially reduce or avoid such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

The proposed PM and NOx emission standards for 1988 and subsequent model year heavy-duty diesel-powered engines and vehicles, and the other amendments proposed by staff, as set forth in Attachments A and B, are technologically feasible and cost effective;

The proposed amendments will more closely align the California Heavy-Duty Diesel Standards and Test Procedures with the revised federal standards and test procedures, thereby helping to assure the continuation of California's waiver of preemption under Section 209 of the Clean Air Act;

The option of certification to the 1988 exhaust emission standards one year early will allow manufacturers designing new engines for the 1987 model year to avoid the need to retest the engines for the 1988 model year;

Particulate emissions averaging for 1991 through 1995 model engines will provide manufacturers with flexibility to certify engines that are more difficult to control, thereby lessening the potential rate of model unavailability;

The projected cost increases for heavy-duty diesel engines and vehicles resulting from the proposed amendments will be largely if not completely offset by associated fuel savings;

The proposed amendments will result in increasing overall reductions of PM emissions starting in 1988 and NOx emissions starting in 1996;

The proposed amendments will result in a significant adverse environmental impact, in that NOx emissions from 1987 or 1988 through 1990 engines will increase; this impact will be partially mitigated by the long-term NOx emissions reductions stemming from the 1991 and subsequent model standards;

The PM emissions reductions from 1988-1990 model heavy-duty diesel engines, when balanced with the NOx emissions increases from such vehicles, will result in an overall net environmental benefit; there are no feasible mitigation measures or alternatives available which would substantially reduce the significant adverse impacts from the NOx emissions increase while maintaining the benefits of the PM emissions reductions.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the amendments to Section 1956.8 of Title 13, California Administrative Code, as set forth in Attachment A hereto.

BE IT FURTHER RESOLVED that the Board hereby approves the amendments to the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel-Powered Engines and Vehicles" as set forth in Attachment B hereto.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt Section 1956.8, Title 13, California Administrative Code, and the incorporated test procedures, as set forth in Attachments A and B, after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board hereby determines that the amendments approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards, will not cause the California requirements to be inconsistent with Section 202(a) of the Clean Air Act, and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to Section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall forward the amended regulation to the Environmental Protection Agency with a request either for confirmation that the amendments are within the scope of an existing waiver, or for issuance of a new waiver, pursuant to Section 209(b)(1) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Board hereby directs the staff to further evaluate more stringent standards for 1991 and later heavy-duty diesel engines, and to report back to the Board with its recommendations as soon as feasible.

BE IT FURTHER RESOLVED that the staff is directed to take appropriate action to credit the emissions reductions provided by this action to California's commitment to reasonable extra efforts to attain the national ambient air quality standards for ozone in the South Coast Air Basin, in Ventura County, and in other parts of the state for which it is shown that reductions in the emissions of nitrogen oxides will reduce ambient ozone concentrations.

I hereby certify that the above is a true and correct copy of Resolution 86-45, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

Amend Title 13, California Administrative Code, Section 1956.8 to read as follows:[1/]

1956.8 Exhaust Emission Standards and Test Procedures--1985 and Subsequent Model Heavy-Duty Engines and Vehicles.

(a) The exhaust emissions from new 1985 and subsequent model heavy-duty diesel-powered engines, except engines used in medium-duty vehicles, shall not exceed:

Exhaust Emission Standards
(grams per brake horsepower-hour)

Model Year	Hydrocarbons	Carbon Monoxide	Oxides of Nitrogen	Particulates
~~1985 and subsequent~~ 1985-1986	1.3	15.5	5.1	--
1987*	1.3	15.5	5.1	--
1988-1990	1.3	15.5	6.0	0.60
1991-1993	1.3	15.5	5.0	0.25** 0.10***
1994 and subsequent	1.3	15.5	5.0	0.10**

* As an option a manufacturer may elect to certify to the 1988 model year emisson standards one year early, for the 1987 model year.

** Emissions averaging may be used to meet this standard, through the 1995 model year only. ~~However, averaging~~ Averaging is ~~restricting~~ restricted to within each useful life subclass. Emissions from engines used in urban buses shall not be included in the averaging program.

*** This standard applies to urban bus engines only.

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1. The Board is also scheduled to consider on April 24, 1986 separately noticed amendments to Section 1956.8 regarding heavy-duty gasoline-powered engines and vehicles. The amendments would add new subsections (c) and (d), reletter existing subsections (c) and (d), and make a change to existing subsection (d) not affecting diesel-powered engines and vehicles. Any amendments made pursuant to the separate notice would be included in the regulation.

(b) The test procedures for determining compliance with standards applicable to 1985 and subsequent heavy-duty diesel models are set forth in the "California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel-Powered Engines and Vehicles," adopted April 8, 1985, as last amended _____.

(c) A manufacturer may elect to certify heavy-duty diesel vehicles of less than 10,000 pounds maximum gross vehicle weight rating as medium-duty vehicles under Section 1960.1 of this chapter, in which event the heavy-duty emission standards and test procedures in this section shall not apply.

(d)(1) In 1985 and future years, the executive officer may authorize use of engines certified to meet federal emission standards, or which are demonstrated to meet appropriate federal emission standards, in up to a total of 100 heavy-duty vehicles, including both gasoline- and diesel-powered heavy-duty vehicles, in any one calendar year when the executive officer has determined that no engine certified to meet California emission standards exists which is suitable for use in the vehicles.

(2) In order to qualify for an exemption, the vehicle manufacturer shall submit, in writing, to the executive officer the justification for such exemption. The exemption request shall show that, due to circumstances beyond the control of the vehicle manufacturer, California certified engines are unavailable for use in the vehicle. The request shall further show that redesign or discontinuation of the vehicle will result in extreme cost penalties and disruption of business. In evaluating a request for an exemption, the executive officer shall consider all relevant factors, including the number of individual vehicles covered by the request and the anti-competitive effect, if any, of granting the request. If a request is

denied, the executive officer shall state in writing the reasons for the denial.

(3) In the event the executive officer determines that an applicant may meet the criteria for an exemption under this subsection, but that granting the exemption will, together with previous exemptions granted, result in over 100 vehicles being permitted under this subsection to use non-California engines in heavy-duty vehicles in any one calendar year, the exemption may be granted only by the state board, under the criteria set forth herein.

NOTE: Authority cited: Section 39600 and 39601, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101 and 43104, Health and Safety Code.

PROPOSED

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1985 AND SUBSEQUENT MODEL HEAVY-DUTY DIESEL-POWERED ENGINES AND VEHICLES

Adopted: April 8, 1985
Amended: _____

NOTE: This document is printed in a style to indicate proposed changes to the version as adopted April 8, 1985. Proposed new language is underlined, and proposed deletions are indicated by strikeouts.

The document incorporates by reference various sections of the Code of Federal Regulations, some with modifications. California provisions which replace specific federal provisions are denoted by the words "DELETE" for the federal language and "REPLACE WITH" for the new California language. The symbols "*****" and "..." mean that the remainder of the federal text for a specific section, which is not shown in these procedures, has been included by reference, with only the printed text changed. For those portions of the referenced federal provisions that are proposed to be changed by the present amendments, and for those portions only, proposed deletions from the federal language are indicated by slashes and proposed additions are indicated by double underline. Federal regulation sections which are not listed have not been proposed as part of the procedures.

Additional language has been added pursuant to a modification approved by the Board on April 25, 1986. The additional language is included in the second paragraph of text and is both underlined and enclosed in brackets.

CALIFORNIA EXHAUST EMISSION STANDARDS AND
TEST PROCEDURES FOR 1985 AND SUBSEQUENT MODEL
HEAVY-DUTY DIESEL-POWERED ENGINES AND VEHICLES

The following provisions of Subparts A, I, and N, Part 86, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency on the date listed, and only to the extent they pertain to heavy-duty diesel-powered engines and vehicles, are adopted and incorporated herein by this reference as the California Exhaust Emission Standards and Test Procedures for 1985 and Subsequent Model Heavy-Duty Diesel-Powered Engines and Vehicles, except as altered or replaced by the provisions set forth below.

The federal regulations contained in the Subparts identified above which pertain to oxides of nitrogen emission averaging shall not be applicable to these procedures. [The federal regulations contained in the Subparts identified above which pertain to particulate emission averaging shall not be applicable to these procedures for 1996 and later model engines and vehicles.] The smoke exhaust test procedures shall be applicable to California heavy-duty diesel-powered engines and vehicles for 1988 and later model years.

Subpart A, General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, 1977 and Later Model Year New Light-Duty Trucks, and for 1977 and Later Model Year New Heavy-Duty Engines.

§86.085-1 General Applicability. ~~May 19, 1983~~ March 15, 1985.

* * * * *

(b) ...GVWR or less to the ~~light-duty truck~~ medium-duty vehicle exhaust emission standards. Heavy-duty...

* * * * *

(e) ... projected combined California sales of passenger cars, light-duty trucks, medium-duty vehicles and heavy-duty engines in its product line are fewer than 3000 units for the model...

* * * * *

§86.085-2 Definitions. November 16, 1983.

* * * * *

"Administrator" DELETE
REPLACE WITH:
"Administrator" means the Executive Officer of the Air Resources Board.

* * * * *

"Certificate of Conformity" DELETE
REPLACE WITH:
"Certificate of Conformity" means "Executive Order" certifying vehicles for sale in California.

"Certification" DELETE
REPLACE WITH:
"Certification" means certification as defined in Section 39018 of the Health and Safety Code.

* * * * *

"Heavy-Duty Engine" DELETE
REPLACE WITH:
"Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.

"Heavy-Duty Vehicle" DELETE
REPLACE WITH:
"Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6,000 pounds, except passenger cars.

* * * * *

"Medium-duty vehicle" means any heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8500 pounds or less.

* * * * *

"Useful life" means:

* * * * *

(f) DELETE
REPLACE WITH:
(f) The useful-life period for purposes of the emissions defect warranty shall be a period of 5 years/100,000 miles, whichever first occurs, for all heavy-duty diesel-powered engines. However, in no case may this period be less than the manufacturer's basic mechanical warranty period for the engine family.

* * * * *

§86.088-2 Definitions. March 15, 1985.

§86.091-2 Definitions. March 15, 1985.

§86.078-3 Abbreviations. January 21, 1980.

§86.084-4 Section numbering; construction. September 25, 1980.

§86.084-5 General Standards; increase in emissions; unsafe conditions. November 2, 1982.

§86.078-7 Maintenance of records; submittal of information; right of entry. November 2, 1982.

§86.085-11 Exhaust emissions from new 1985 and later model year diesel heavy-duty engines. November 16, 1983.

* * * * *

(a)(1)(iii) Oxides of Nitrogen. 5.1 grams per ...

* * * * *

(b) DELETE
PEPLACE WITH:
(b) At the option of the manufacturer, the standards set forth in Section 86.088-11, paragraph (a)(1) can replace the standards set forth in paragraph (a)(1), applicable to new 1987 model year diesel heavy-duty engines only.

* * * * *

(d) ... in Subpart N of this part to ascertain...

* * * * *

§86.088-11 Emission standards for 1988 and later model year diesel heavy-duty engines. March 15, 1985.

§86.091-11 Emission standards for 1991 and later model year diesel heavy-duty engines. March 15, 1985.

* * * * *

(a)(1)(iv)(C)...family particulate limits may not exceed 0.60 gram per brake horsepower-hour. Heavy-duty diesel engines converted to methanol fuel may be used to comply with the urban bus particulate standard and may be used in the averaging program. Such engines must comply with all applicable heavy-duty diesel engine emission standards and test procedures in this Part.

* * * * *

§86.094-11 Emission standards for 1994 and later model year diesel heavy-duty engines. March 15, 1985.

* * * * *

(a)(1)(iv)(B)...family particulate limits may not exceed 0.60 gram per brake horsepower-hour. Heavy-duty diesel engines converted to methanol fuel may be used to comply with the urban bus particulate standard and may be used in the averaging program. Such engines must comply with all applicable heavy-duty diesel engine emission standards and test procedures in this Part.

* * * * *

§86.080-12 Alternative certification procedures. April 17, 1980.

~~§86.082-14~~ §86.084-14 Small-volume manufacturers certification procedures. ~~November 2, 1982~~ January 31, 1985.

* * * * *

(b)(1) ... produced by manufacturers with California sales (for the model year in which certification is sought) of fewer than 3,000 units (PC, LDT, MDV, and HDE combined).

* * * * *

(c)(4)~~(i)~~ DELETE
REPLACE WITH:
(c)(4)~~(i) The manufacturer~~ Small volume manufacturers shall include in its records all of the information that EPA requires in ~~§86.082-21~~ §86.084.21 ~~of this subpart~~. This information will be considered part of the manufacturer's application for certification.

* * * * *

(c)(7)(i)~~(B)~~(C) ... determines and prescribes based on design specifications or sufficient control over design specifications, development data, in-house testing procedures, and in-use experience. However, ...

* * * * *

(c)(11)(ii)(D)(1)...We project the total California sales of vehicles (engines) subject to this subpart to be fewer than 3,000 units.

* * * * *

~~(c)(11)(ii)(D)(5) DELETE~~
~~REPLACE WITH:~~
~~(c)(11)(ii)(D)(5) A statement that based on the manufacturers emission testing the vehicles sold comply with the high altitude emission requirements.~~

* * * * *

(c)(13)(ii)...affect vehicle emissions. All running changes which do not adversely affect emissions or the emissions control system durability are deemed approved unless disapproved by the Executive Officer within 30 days of the implementation of the running change. This ...

* * * * *

§86.085-20 Incomplete vehicles, classification. January 12, 1983.

§86.085-21 Application for certification. ~~November 16, 1983~~ December 10, 1984.

§86.087-21 Application for certification. November 16, 1983.

§86.088-21 Application for certification. March 15, 1985.

§86.091-21 Application for certification. March 15, 1985.

§86.085-22 Approval of application for certification; test fleet selections; determinations of parameters subject to adjustment for certification and Selective Enforcement Audit, adequacy of limits, and physically adjustable ranges. ~~November 16, 1983~~ August 30, 1985.

DELETE any reference to Selective Enforcement Audit.

§86.085-23 Required data. ~~November 16, 1983~~ March 15, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

§86.087-23 Required data. ~~November 16, 1983~~ March 15, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

§86.088-23 Required data. July 19, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

(f) DELETE

* * * * *

§ 86.091-23 Required data. July 19, 1985.

* * * * *

(b)(1)(ii) ... useful life of the engine. Such data shall be submitted to the executive officer for review. If the durability test method is accepted by EPA, it shall also be accepted by ARB, subject to the following condition. If, after certification for the first model year in which the method is used, the executive officer determines that a manufacturer's durability test procedures do not conform with good engineering practices, the executive officer may require changes to that manufacturer's durability test procedures for subsequent model years. The manufacturer's revised durability test procedures shall be submitted to the executive officer for review and approval.

* * * * *

§86.085-24 Test vehicles and engines. ~~January 12, 1983~~ January 31, 1985.

* * * * *

(e)(1)(i) DELETE
REPLACE WITH:
(e)(1)(i) a combined total of 3000 California passenger cars, light-duty trucks, medium-duty vehicles, and heavy-duty engines,
(e)(1)(ii) DELETE
(e)(1)(iii) DELETE
(e)(1)(iv) DELETE
(e)(1)(v) DELETE
(e)(1)(vi) DELETE
(e)(2)...total sales of fewer than 3,000...

* * * * *

(f) ...submitted. Durability data submitted may be from engines previously certified by the EPA or the Air Resources Board.

* * * * *

§86.085-25 Maintenance. November 16, 1983.

§86.087-25 Maintenance. March 15, 1985.

§86.088-25 Maintenance. March 15, 1985.

§86.084-26 Mileage and service accumulation; emission measurements.

~~February 18, 1983~~ October 19, 1983.

§86.085-27 Special test procedures. January 12, 1983.

§86.085-28 Compliance with emission standards. ~~November 16, 1983~~ January 24, 1985.

* * * * *

~~(c)(4)(ii)...CO, and NOx.~~

* * * * *

~~(c)(4)(iii)(B)(3) DELETE~~

* * * * *

§86.087-28 Compliance with emission standards. ~~November 16, 1983~~ March 15, 1985.

§86.088-28 Compliance with emission standards. March 15, 1985.

§86.091-28 Compliance with emission standards. March 15, 1985.

§86.085-29 Testing by the Administrator. ~~November 16, 1983~~ January 24, 1984.

§86.087-29 Testing by the Administrator. January 24, 1984.

§86.088-29 Testing by the Administrator. March 15, 1985.

§86.091-29 Testing by the Administrator. March 15, 1985.

§86.085-30 Certification. ~~January 12, 1983~~ January 24, 1984.

§86.087-30 Certification. August 30, 1985.

§86.088-30 Certification. March 15, 1985.

§86.091-30 Certification. March 15, 1985.

§86.079-31 Separate certification. September 8, 1977.

§86.079-32 Addition of a vehicle or engine after certification. September 8, 1977.

§86.079-33 Changes to a vehicle or engine covered by certification. September 8, 1977.

§86.082-34 Alternative procedure for notification of additions and changes. November 2, 1982.

§86.085-35 Labeling. Labels shall comply with the requirements set forth in the "California Tune-Up Label Specifications", as last amended April 8, 1985.

§86.085-37 Production vehicles and engines. January 12, 1983.

§86.085-38 Maintenance instructions. November 16, 1983.

§86.087-38 Maintenance Instructions. March 15, 1985.

~~§86.084-39 Automatic expiration of reporting and record-keeping requirements. January 21, 1980.~~

§86.084-40 Automatic expiration of reporting and recordkeeping requirements. September 25, 1980.

~~§86.087-21 Application for certification.--November 16, 1983.~~

~~§86.087-23 Required data.--November 16, 1983.~~
~~§86.087-28 Compliance with emission standards.--November 16, 1983.~~

* * * * *

~~(c)(4)(iii)(B)-(3)--DELETE~~

* * * * *

~~§86.087-35 Labeling.--Engine labels shall comply with the requirements set forth in the "California Tune-Up Label Specifications", as last amended on April 8, 1986.~~

Subpart I - Emission Regulations for New Diesel-Fueled Heavy-Duty Engines; Smoke Exhaust Test Procedure

§86.884-1 General Applicability. November 16, 1983.

§86.884-2 Definitions. November 16, 1983.

§86.884-3 Abbreviations. November 16, 1983.

§86.884-4 Section numbering. November 16, 1983.

§86.884-5 Test Procedures. November 16, 1983.

§86.884-6 Diesel fuel specifications. November 16, 1983.

§86.884-7 Dynamometer operation cycle for smoke emission tests. November 16, 1983.

§86.884-8 Dynamometer and engine equipment. November 16, 1983.

§86.884-9 Smoke measurement system. November 16, 1983.

§86.884-10 Information. November 16, 1983.

§86.884-11 Instrument checks. November 16, 1983.

§86.884-12 Test run. November 16, 1983.

§86.884-13 Data analysis. November 16, 1983.

§86.884-14 Calculations. November 16, 1983.

Subpart N, Emission Regulations for New Gasoline- and Diesel-Fueled Heavy-Duty Engines; Gaseous Exhaust Test Procedures

§86.1301-84 Scope; applicability. November 16, 1983.

§86.1301-88 Scope; applicability. March 15, 1985.

§86.1302-84 Definitions. November 16, 1983.

§86.1303-84 Abbreviations. November 16, 1983.

§86.1304-84 Section numbering; construction. November 16, 1983.

§86.1305-84 Introduction; structure of subpart. November 16, 1983.

§86.1306-84 Equipment required and specifications; overview. November 16, 1983.

§86.1306-88 Equipment required and specifications; overview. March 15, 1985.

§86.1308-84 Dynamometer and engine equipment specifications. ~~November 16, 1983~~ December 10, 1984.

§86.1309-84 Exhaust gas sampling system; gasoline-fueled engines. November 16, 1983.

§86.1310-84 Exhaust gas sampling and analytical system; diesel-fueled engines. ~~November 16, 1983~~ March 15, 1985.

§86.1310-88 Exhaust gas sampling and analytical system; diesel engines. March 15, 1985.

§86.1311-84 Exhaust gas analytical system; CVS bag sample. November 16, 1983.

§86.1312-88 Weighing chamber and microgram balance specifications. March 15, 1985.

§86.1313-84 Fuel specifications. December 10, 1984.

~~§86.1313-84~~ §86.1314-84 Analytical gases. ~~November 16, 1983~~ December 10, 1984.

§86.1316-84 Calibration; frequency and overview. ~~November 16, 1983~~ December 10, 1984.

§86.1318-84 Engine dynamometer system calibrations. ~~November 16, 1983.~~ December 10, 1984.

§86.1319-84 CVS calibration. ~~November 16, 1983~~ December 10, 1984.

§86.1320-88 Gas meter or flow instrumentation calibration, particulate measurement. March 15, 1985.

§86.1321-84 Hydrocarbon analyzer calibration. ~~November 16, 1983~~ December 10, 1984.

§86.1322-84 Carbon monoxide analyzer calibration. November 16, 1983.

§86.1323-84 Oxides of nitrogen analyzer calibration. ~~November 16, 1983.~~ December 10, 1984.

§86.1324-84 Carbon dioxide analyzer calibration. November 16, 1983.

§86.1326-84 Calibration of other equipment. November 16, 1983.

§86.1327-84 Engine dynamometer test procedures; overview. ~~November 16, 1983.~~ December 10, 1984.

§86.1327-88 Engine dynamometer test procedures; overview. March 15, 1985.

§86.1330-84 Test sequence, general requirements. November 16, 1983.

§86.1332-84 Engine mapping procedures. ~~November 16, 1983~~ December 10, 1984.

§86.1333-84 Transient test cycle generation. November 16, 1983.

§86.1334-84 Pre-test engine and dynamometer preparation. ~~November 16, 1983~~ December 10, 1984.

§86.1335-84 Optional forced cool-down procedure. November ~~16, 1983~~. December 10, 1984.

§86.1336-84 Engine starting and restarting. ~~November 16, 1983~~ March 15, 1985.

§86.1337-84 Engine dynamometer test run. November 16, 1983.

§86.1337-88 Engine dynamometer test run. March 15, 1985.

§86.1338-84 Emission measurement accuracy. November 16, 1983.

§86.1339-88 Diesel particulate filter handling and weighing. March 15, 1985.

§86.1340-84 Exhaust sample analysis. ~~November 16, 1983~~ December 10, 1984.

§86.1341-84 Test cycle validation criteria. ~~November 16, 1983~~ March 15, 1985.

§86.1342-84 Calculations; exhaust emissions. ~~November 16, 1983~~ March 15, 1985.

§86.1343-88 Calculations; particulate exhaust emissions (diesels only). March 15, 1985.

§86.1344-84 ~~Information required~~ Required information. November 16, 1983.

§86.1344-88 Required information. March 15, 1985.

Appendix I - Urban Dynamometer Schedules.

(f)(2) EPA Engine Dynamometer Schedule for Heavy-Duty Diesel Engines. ~~November 16, 1983~~ December 10, 1984.

Additional Requirements

1. Any reference to vehicle or engine sales throughout the United States shall mean vehicle or engine sales in California.
2. Regulations concerning EPA hearings, EPA inspections, and specific language on the Certificate of Conformity, shall not be applicable to these procedures.

~~3. If a gasoline powered engine requires the use of unleaded fuel, a statement will be required that the engine and transmission combinations for which certification is requested are designed to operate satisfactorily on a gasoline having a research octane number not greater than 91.~~

3. Any reference made to Selective Enforcement Auditing (SEA) shall not be applicable to these procedures.

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Amendments to Regulations Regarding Certification of Heavy-Duty Diesel-Powered Engines and Vehicles

Agenda Item No.: 86-5-3

Public Hearing Date: April 25, 1986

Response Date: June 4, 1986

Issuing Authority: Air Resources Board

Comment: The Staff Report, Final Statement of Reasons, and Resolution 86-45 are incorporated by reference.

The Staff Report identified beneficial and adverse environmental impacts resulting from the proposed amendments (see particularly Staff Report Sections VI.A and III.A.). The amendments will result in significant emissions reductions of particulate starting in 1988 and oxides of nitrogen (NOx) starting in 1996. The amendments to the 1987-1990 model-year NOx standards will result in a significant adverse environmental impact, in that NOx emissions from 1987 or 1988-1990 model-year engines will increase.

Various public comments were received identifying environmental issues pertaining to this item. These comments are summarized and responded to in the Final Statement of Reasons.

Response: The Board determined that the particulate emissions reductions from 1987-1990 heavy-duty gasoline engines, when balanced with the NOx emissions increases from such vehicles, will result in an overall net health benefit. The Board further determined that the adverse environmental impact resulting from the 1987-1990 NOx standards will be partially mitigated by the long-term NOx reductions stemming from the 1991 and subsequent model standards. The Board determined that there are no feasible mitigation measures or alternatives available which would substantially reduce the adverse impact from the 1987-1990 NOx emissions increase while maintaining the concomitant benefits of the particulate emissions reductions. The alternative of retaining the existing NOx standard through 1991, in conjunction with the particulate standards, is infeasible because with currently available control methods, decreasing particulate emissions generally increases NOx emissions and vice versa due to the fundamental nature of diesel combustion.

Certified: Harold Holmes
Board Secretary

Date: August 5, 1986

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : August 27, 1986

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
85-77
85-78
85-80
86-4
86-25
86-43
86-44
86-45

State of California
AIR RESOURCES BOARD

Resolution 86-46
May 22, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 110-17, entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 110-17, entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California," submitted by the University of California, Davis for a total amount not to exceed $58,127.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee and approves the following:

> Proposal Number 110-17, entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California," submitted by the University of California, Davis for a total amount not to exceed $58,127.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $58,127.

I hereby certify that the
above is a true and correct
copy of Resolution 86-64 as
adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO: 86-6-4 (b) (1)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 110-17 entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California"

RECOMMENDATION: Adopt Resolution 86-46 approving Proposal No. 110-17 for funding in an amount not to exceed $58,127.

SUMMARY: The purpose of this project is to obtain an estimate of the dry deposition of particles and ozone to high elevations in the Sierra Nevada at Sequoia National Park, and to provide a comparison between the chemical composition of ambient air samples and rainfall which is collected concurrently.

The project consists of the following elements. First, using two samplers at each site, particles would be monitored at 6000 feet and 10,000 feet elevations during the summer months. One sampler at each site would be analyzed with a 4-hour time resolution for comparison to rain events. The other sampler would collect particles in two size ranges for deposition estimates. Second, ozone would be monitored at the 10,000-foot site during the summer for comparison to existing monitoring at the lower site. These measurements would be the first extended measurements at the high elevation site. Third, upper level winds would be measured twice each day during the summer to aid interpretation of rain events and transport patterns. Fourth, the 6000-foot site would continue operation during the fall, winter, and spring on the same schedule as an existing sampler operated by the contractor at Yosemite National Park for the National Park Service. This concurrent operation for the remainder of the year would provide an estimate of the annual north-south gradient of particle concentrations in the Southern Sierra Nevada.

The principal investigator would be Dr. Thomas A. Cahill from the University of California, Davis.

BUDGET SUMMARY

University of California, Davis

"Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California"

BUDGET ITEMS:

Salaries	$17,300	
Benefits*	-0-	
Supplies	4,470	
Other Costs**	28,984	
Travel	3,200	
TOTAL, Direct Costs		$53,954
TOTAL, Indirect Costs		4,173
	TOTAL PROJECT COST	$58,127

* Benefits included in salaries

** Includes $13,684 for sample analysis, and $10,700 for ozone and humidity monitors

State of California
AIR RESOURCES BOARD

Resolution 86-47
April 25, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1419-126, entitled "Comparison of Indoor and Outdoor Toxic Air Pollutant Levels in Several Southern California Communities," has been submitted by the Research Triangle Institute;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1419-126, entitled "Comparison of Indoor and Outdoor Toxic Air Pollutant Levels in Several Southern California Communities," submitted by the Research Triangle Institute for a total amount not to exceed $200,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1419-126, entitled "Comparison of Indoor and Outdoor Toxic Air Pollutant Levels in Several Southern California Communities," submitted by the Research Triangle Institute for a total amount not to exceed $200,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $200,000.

I hereby certify that the above is a true and correct copy of Resolution 86-47, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM: 86-5-4 (b) (2)
DATE: April 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1419-126 entitled "Comparison of Indoor and Outdoor Toxic Air Pollutant Levels in Several Southern California Communities."

RECOMMENDATION: Adopt Resolution 86-47 approving Proposal No. 1419-126 for funding in an amount not to exceed $200,000.

SUMMARY:

For the ARB to evaluate fully the risk to human populations posed by toxic air contaminants, the staff must have estimates of human exposures to these substances. A significant portion of the total exposure to some toxic air contaminants may occur indoors, where outdoor-indoor transfer of toxics may contribute significantly to this indoor exposure. The ARB lacks the necessary measurements of indoor levels of toxic air contaminants to estimate human exposures confidently. Moreover, there are no California data available on the contribution of outdoor levels of toxic air contaminants to the levels indoors.

This proposal is for ARB participation in a monitoring project scheduled to continue under overall Environmental Protection Agency sponsorship. That project will be a restudy of one of the areas tested in a recently completed field study called TEAM (Total Exposure Assessment Methodology). The TEAM study was funded by EPA and was designed to measure human exposure to a variety of volatile organic substances that are suspected of being toxic or have been declared toxic. Staff from the ARB have negotiated a cooperative effort with the EPA to extend the TEAM study to include an intensive restudy of an area located in southern California. ARB's participation will provide funds for concurrent indoor/outdoor monitoring of levels of approximately 30 volatile organic compounds at 55 homes during two seasons. The EPA is funding the overall project at approximately $600,000 with a somewhat different set of objectives. Our participation, by contributing $200,000, will ensure that the study will be performed in southern California and that data needed for ARB's Risk Assessment and Risk Management Program are collected.

BUDGET SUMMARY

Research Triangle Institute

"Comparison of Indoor and Outdoor Toxic Air Pollutant Levels in Several Southern California Communities"

BUDGET ITEMS:

Salaries/Benefits	$71,387	
Supplies	16,680	
Other Costs	3,005	
Travel	10,000	
Fixed Fee	15,668	
TOTAL, Direct Costs		$116,740
TOTAL, Indirect Costs		83,260
TOTAL PROJECT COST		$200,000

State of California
AIR RESOURCES BOARD

Resolution 86-48
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1418-126, entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates," has been submitted by the Valley Research Corporation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1418-126, entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates," submitted by the Valley Research Corporation for a total amount not to exceed $74,955.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1418-126, entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates," submitted by the Valley Research Corporation for a total amount not to exceed $74,955.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $74,955.

I hereby certify that the above is a true and correct copy of Resolution 86-48 as adopted by the Air Resources Board.

Hitaka Kimura for

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (3)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1418-126 entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates."

RECOMMENDATION: Adopt Resolution 86-48 approving Proposal No. 1418-126 for funding in an amount not to exceed $74,955.

SUMMARY:

The purpose of this project is to develop standard procedures for establishing the uncertainties of the individual and aggregated factors which comprise the inventory of air polluting emissions from point, area and mobile sources.

The Air Resources Board and air pollution control districts use emission estimates to develop and implement air quality management strategies and for a variety of other purposes. Currently, the ARB and local districts do not have uniform procedures for estimating the uncertainties of single emission estimates or for aggregating these estimates to obtain emissions of totals that have a known accuracy. Previous ARB-sponsored research projects on emission inventories have not included statistical analyses of uncertainties. Both the South Coast and Bay Area Air Quality Management Districts have attempted to estimate uncertainties in their emission inventories, but the procedures developed were shown to have some deficiencies and were therefore not adopted by the ARB.

The proposed study has three objectives: to select the most appropriate statistical form for estimates of uncertainties in emission inventories; to develop procedures for computing uncertainties in the selected form for emissions from point, mobile, and area sources; and to assemble a handbook describing the foregoing statistical forms and procedures and demonstrating the use of these in actual applications.

The study will be conducted by the Valley Research Corporation. The principal investigator will be Dr. Yuji Horie.

BUDGET SUMMARY

Valley Research Corporation

"Development of Procedures for Establishing

the Uncertainties of Emission Estimates"

BUDGET ITEMS:

Salaries	$25,200	
Benefits	17,640	
Travel	1,350	
Contractors*	12,900	
Other Costs**	3,750	
TOTAL, Direct Costs		$60,840
TOTAL, Indirect Costs		14,115
TOTAL PROJECT COST		$74,955

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* The principal consultants are: Dr. Charles Stone and Mr. Richard Rapoport

** Reproduction, Word Processing

State of California
AIR RESOURCES BOARD

Resolution 86-49
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1414-126, entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1414-126, entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California," submitted by the University of California, Riverside for a total amount not to exceed $193,552.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1414-126, entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California," submitted by the University of California, Riverside for a total amount not to exceed $193,552.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $193,552.

I hereby certify that the above is a true and correct copy of Resolution 86-49 as adopted by the Air Resources Board.

Utako Kimura

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (4)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1414-126 entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California."

RECOMMENDATION: Adopt Resolution 86-49 approving Proposal No. 1414-126 for funding in an amount not to exceed $193,552.

SUMMARY: Section 39650 et seq. of the California Health and Safety Code (Assembly Bill 1807, Tanner, 1983) directs the Air Resources Board to identify and adopt control measures for toxic air contaminants. The ARB staff has assembled a list of candidate toxic air contaminants to be evaluated. These compounds are grouped according to evidence for: risk of harm to public health; amount or potential amount of emissions; manner of usage; persistence in the atmosphere; and ambient concentrations. Included on this list are polycyclic aromatic hydrocarbons (PAHs).

High localized concentrations of PAHs have been measured in the vicinity of various types of emission sources, including: woodstoves and fireplaces; diesel and gasoline engines; asphalt roofing; agricultural and other waste burning; creosote wood preserving; and food preparation operations. PAH compounds including the nitrated PAHs have been shown to be both toxic and carcinogenic to animals and are associated with cancer in humans.

The objective of this study is to determine ambient concentrations of PAHs and nitro-PAHs at seven locations in California with high probability of occurrence of these pollutants. The study will be directed towards unsubstituted, hetero- and nitro-PAHs with priority given to compounds or precursors of compounds identified as having "sufficient" evidence of carcinogenicity in animals, according to recognized authorities. Ames testing for evidence of mutagenicity in the ambient samples will also be conducted.

The study will be performed by the Statewide Air Pollution Research Center, University of California, Riverside. Dr. Roger Atkinson will be the principal investigator.

B U D G E T S U M M A R Y

University of California, Riverside

"A Survey of Ambient Concentrations of
Selected Polycyclic Aromatic Hydrocarbons (PAHs) at
Various Locations in California"

BUDGET ITEMS:

Salaries	$100,485	
Benefits	24,347	
Computer search	3,120	
Equipment**	9,700	
Supplies***	18,871	
Travel	15,715	
Other Costs*	4,600	
TOTAL, Direct Costs		$176,838
TOTAL, Indirect Costs		16,714
TOTAL PROJECT COST		$193,552

* Includes Hi-Vol, GC/MS maintenance
** Chavt Recorders ($3000); NO/NOx Analyzer ($6700)
*** Capillary columns, solvents, high-purity gases,
Teflon-coated filters, Petri dishes, Ames testing supplies

State of California
AIR RESOURCES BOARD

Resolution 86-50
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1426-126a, entitled "Southern California Air Quality Study: Sample Analyses and Reporting," has been submitted by Combustion Engineering, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1426-126a, entitled "Southern California Air Quality Study: Sample Analyses and Reporting," submitted by Combustion Engineering, Inc. for an amount not to exceed $385,364.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1426-126a, entitled "Southern California Air Quality Study: Sample Analyses and Reporting," submitted by Combustion Engineering, Inc. for an amount not to exceed $385,364.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $385,364.

I hereby certify that the above is a true and correct copy of Resolution 86-50 as adopted by the Air Resources Board.

Utako Yamura
for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (5)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-126a entitled "Southern California Air Quality Study: Sample Analyses and Reporting"

RECOMMENDATION: Adopt Resolution 86-50 approving proposal 1426-126a for funding in an amount not to exceed $385,364.

SUMMARY: The Air Resources Board is sponsoring a multi-year integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July of 1987. The overall objective of that program is to develop a comprehensive meteorologic and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. The backbone of the study is a network of approximately nine specially equipped air quality monitoring stations located throughout the basin in such a way as to permit detailed study of an air parcel from offshore at a site such as San Nicolas Island, through areas of heavy mobile source and industrial emissions, along a trajectory ending at a far downwind receptor area such as Riverside.

To accomplish this task in a cost-effective manner, existing air quality monitoring stations operated by the South Coast Air Quality Management District will be equipped with additional instrumentation and equipment to make detailed measurements of both primary and secondary gaseous pollutants and reaction intermediates and of the the detailed composition of size-resolved aerosol particles.

The purpose of this contract is to work with the ARB the Project Manager (Sonoma Technology) and AeroVironment to select and prepare sites for up to nine monitoring stations. The contractors will also be required to analyze samples collected during the two intensive sampling periods, one during the summer of 1987 and the other during the late fall/early winter of 1987-88.The contractor will be responsible for quality control and will write a final report and prepare a computer-readable data base of meteorologic and aerometric data collected under the terms of this contract.

The principal investigator for Combustion Engineering is Dr. William Keifer.

B U D G E T S U M M A R Y

Combustion Engineering

"Southern California Air Quality
Study: Sample Analyses and Reporting"

BUDGET ITEMS

1.	Direct Labor	$147,996
2.	Overhead (97.46% of 1)	144,237
3.	Materials*	59,324
4.	Transportation	1,770
5.	Per Diem	220
6.	G & A	-0-
7.	Fee (9% of 1 through 6)	31,817
	TOTAL	$385,364

*Expendable laboratory supplies to analyze samples collected on all Type B stations:

Description	Number	Total Cost
Nylasorb 47mm Filters	1000	$ 3,080
Zefluor 47mm Filters	1000	1,700
Teflon 37mm Filters	2000	5,500
Filter Holders	430	1,720
Plastic Beakers	6000	1,942
Filter Pak Sampler	10	16,000
Teflon Filter Holders	216	27,000
Miscellaneous Other Supplies		2,382
TOTAL		$59,324

State of California
AIR RESOURCES BOARD

Resolution 86-51
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1426-126c, entitled "Southern California Air Quality Study: Prototype Instrumentation," has been submitted by Sonoma Technology, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1426-126c, entitled "Southern California Air Quality Study: Prototype Instrumentation," submitted by Sonoma Technology, Inc. for a total amount not to exceed $52,218.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1426-126c, entitled "Southern California Air Quality Study: Prototype Instrumentation," submitted by Sonoma Technology, Inc. for a total amount not to exceed $52,218.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $52,218.

I hereby certify that the above is a true and correct copy of Resolution 86-51 as adopted by the Air Resources Board.

Itako Kimura
for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b)(6)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-126c entitled "Southern California Air Quality Study: Prototype Instrumentation"

RECOMMENDATION: Adopt Resolution 86-51 approving Proposal No. 1426-126c for funding in an amount not to exceed $52,218.

SUMMARY: The Air Resources Board is sponsoring a multi-year integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July of 1987. The overall objective of that program is to develop a comprehensive meteorologic and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. The backbone of the study is a network of approximately nine specially equipped air quality monitoring stations located throughout the Basin in such a way as to permit detailed study of an air parcel from offshore at a site such as San Nicolas Island, through areas of heavy mobile source and industrial emissions, along a trajectory ending at a far downwind receptor area such as Riverside.

To accomplish this task in a cost-effective manner, existing air quality monitoring stations operated by the South Coast Air Quality Management District will be equipped with additional instrumentation and equipment to make detailed measurements of both primary and secondary gaseous pollutants and reaction intermediates and of the detailed composition of size-resolved aerosol particles.

The major objectives of this project are to build one prototype sampler for aerosol sizing and to provide the data acquisition system for the routine monitoring Class B stations in the SCAQS program. The project consists of 3 tasks: 1) prototype preparation and testing; 2) construction of electronic controls for samplers: and 3) support for assembly and laboratory tests for up to nine field-worthy samplers. This project is intended to complement the proposal from Combustion Engineering/Aerovironment.

Sonoma Technology Inc. would serve as the contractor for this effort. The principal investigator would be Dr. Donald Blumenthal.

State of California
AIR RESOURCES BOARD

Resolution 86-52
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1416-126, entitled "A Study of Excess Motor Vehicle Emissions - Causes and Control," has been submitted by Sierra Research, Inc./Radian Corporation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1416-126, entitled "A Study of Excess Motor Vehicle Emissions - Causes and Control," submitted by Sierra Research, Inc./Radian Corporation for a total amount not to exceed $199,937.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1416-126, entitled "A Study of Excess Motor Vehicle Emission - Causes and Control," submitted by Sierra Research, Inc./Radian Corporation for a total amount not to exceed $199,937.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $199,937.

I hereby certify that the above is a true and correct copy of Resolution 86-52 as adopted by the Air Resources Board.

Italo Pizzini for
Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b)(7)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1416-126 entitled "A Study of Excess Motor Vehicle Emissions - Causes and Control"

RECOMMENDATION: Adopt Resolution 86-52 approving Proposal No. 1416-126 for funding in an amount not to exceed $199,937.

SUMMARY: This study is intended to investigate the causes of excess emissions* from light-duty vehicles, to evaluate potential measures which could reduce these emissions, and to gather information that would assess the adequacy of State and Federal standards in the area of heavy-duty diesel engines. Additional tasks to be carried out in this project are:

1. the development of an "expert" computer system to enhance the effectiveness of inspectors and repair mechanics in isolating and repairing emission control malfunctions;

2. assessing the effects of gasoline composition upon exhaust systems and assessing the potential for emission reductions through limitations on fuel additives and impurities; and

3. determining the causes of catalyst deterioration.

The principal investigators will be Robert Dulla of Sierra Research and Rob Klausmeier of Radian Corp.

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* "Excess emissions" are defined as those emissions which exceed the standards to which vehicles are originally certified.

BUDGET SUMMARY

Sierra Research, Inc./Radian Corporation

"A Study of Excess Motor Vehicle

Emissions-Causes & Control"

BUDGET ITEMS:	SIERRA	RADIAN	TOTAL
Salaries	$43,760	$33,492	$77,252
Benefits	11,853	*	11,853
Travel	5,698	2,720	8,418
Other Costs	1,500	200	1,700
TOTAL, Direct Costs	$62,811	$36,412	$99,223
TOTAL, Indirect Costs	38,109	62,605	100,714
TOTAL PROJECT COST			$199,937

* Not specified

State of California
AIR RESOURCES BOARD

Resolution 86-53
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1420-126, entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2," has been submitted by Unisearch Associates, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1420-126, entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2," submitted by Unisearch Associates, Inc. for a total amount not to exceed $23,322.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1420-126, entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2," submitted by Unisearch Associates, Inc. for a total amount not to exceed $23,322.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $23,322.

I hereby certify that the above is a true and correct copy of Resolution 86-53 as adopted by the Air Resources Board.

Utako Kimura
for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (8)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1420-126 entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2"

RECOMMENDATION: Adopt Resolution 86-53 approving Proposal No. 1420-126 for funding in an amount not to exceed $23,322.

SUMMARY: The Air Resources Board is sponsoring a multi-year, integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July 1987. The overall objective of that program is to develop a comprehensive meteorological and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. An important component of the field study will be the accurate measurement of hydrogen peroxide (H_2O_2) in a multi-station mode. Therefore, it is necessary to perform a H_2O_2 methods comparison study in Los Angeles. The major objective of this study will be to determine measurement methods for gas phase H_2O_2, which can be used in a multi-station monitoring mode in Los Angeles, whose validity, accuracy and precision are known.

Hydrogen peroxide present in polluted urban atmospheres may play an important role in both the formation of photochemical smog and atmospheric acidity. However, few reliable data are available on ambient concentrations of H_2O_2.

This project is to make measurements of formaldehyde (HCHO) and hydrogen peroxide (H_2O_2) by tunable diode laser absorption spectroscopy for a ten-day period during the Carbonaceous Species Methods Comparison Study, which is scheduled to take place in August 1986. The total cost of this study is $44,322, of which $21,000 would be paid by the Electric Power Research Institute (EPRI) under a separate contract between EPRI and Unisearch. As proposed herein, the ARB would have a separate contract with Unisearch for a total amount not to exceed $23,322 and with a budget summary as shown in the attachment.

The principal investigator would be Dr. Harold Schiff of Unisearch Associates, Inc.

BUDGET SUMMARY

Unisearch Associates, Inc.

"Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2"

BUDGET ITEMS*:

Salaries	$12,285		
Equipment Rental	5,000		
Other Costs	500		
TOTAL, Direct Costs			$17,785
TOTAL, Indirect Costs			5,537
		TOTAL PROJECT COST	$23,322

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* In addition to $23,322 from the ARB allocated as shown above, $21,000 of funding from the Electric Power Research Institute (EPRI), provided under a separate contract between EPRI and Unisearch, will be used for transportation ($12,680) and overhead ($8,320).

State of California
AIR RESOURCES BOARD

Resolution 86-54
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1421-126, entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects," has been submitted by the University of California, Irvine;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1421-126, entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects," submitted by the University of California, Irvine for a total amount not to exceed $157,493.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1421-126, entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects," submitted by the University of California, Irvine for a total amount not to exceed $157,493.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $157,493.

I hereby certify that the above is a true and correct copy of Resolution 86-54 as adopted by the Air Resources Board.

Hilda Ximiera
for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (9)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1421-126 entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects."

RECOMMENDATION: Adopt Resolution 86-54 approving Proposal No. 1421-126 for funding in an amount not to exceed $199,166.

SUMMARY: The scientific basis for the State and Federal ambient air quality standards for carbon monoxide (CO) has recently come under close scrutiny. The main impetus in recent research has been to replicate earlier findings in patients prone to developing angina pectoris, but the results of that research have raised some concerns about current knowledge of CO effects. This project is to fund a diverse group of investigators at UC Irvine, headed by Dr. Michael Kleinman, to begin a coordinated and thorough study of the effects of CO. This work is planned as the first year of a two-year study.

The first objective of the project is to resolve problems with techniques for measuring carboxyhemoglobin (COHb) by improving protocols for operating an instrument widely used for this purpose and by evaluating a new and promising instrumental approach for COHb measurement. The second objective is to evaluate factors that contribute to differences in COHblevels in different individuals by performing a thorough literature survey regarding the distribution of key physiological parameters in various parts of the population.

The third objective is to characterize populations with problems of heart rhythm. The investigators will review the scientific literature and the results of a previous clinical study in order to design studies to investigate the effect of CO on the development of cardiac rhythm problems in susceptible individuals. The fourth objective is to evaluate the influence of dose and dose rate on observed changes in the time of onset and duration of angina pain. This work is important in investigating criticisms of present protocols of presenting high exposures of CO to test subjects.

The fifth objective is to conduct detailed cardiac tests of angina patients during CO exposure in order to investigate the physiological mechanisms that produce the pain. The final objective is to obtain in vitro measurement of CO effects on the function and metabolism of heart muscle.

The results of this study would be useful in assessing effects of CO on ischemic heart disease, the basis of the current ambient CO standards. In addition, it would more fully elucidate the mechanism through which relatively small amounts of CO produce such profound effects on heart muscle tissue. Current theories cannot fully account for this observation. A more complete understanding of the mechanism would place our ambient air quality standards on a much firmer scientific basis.

B U D G E T S U M M A R Y

University of California, Irvine

"Coordinated Multidisciplinary Research Program on
Carbon Monoxide Health Effects"

BUDGET ITEMS:

Salaries	$ 103,796		
Benefits	28,769		
Supplies	9,177		
Other Costs	19,700		
Travel	-0-		
Equipment*	21,580		
TOTAL, Direct Costs			$ 183,022
TOTAL, Indirect Costs			16,144
		TOTAL PROJECT COST	$ 199,166

*Beckman rectilinear recorder $ 4,500
Beckman UV/VIS accessories 3,000
Van Slyke apparatus 2,200
Reduction gas analyzer 11,880

State of California
AIR RESOURCES BOARD

Resolution 86-55
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1394-125, entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings," has been submitted by Calcoast Analytical Labs;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1394-125, entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings," submitted by Calcoast Analytical Labs for a total amount not to exceed $74,850.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1394-125, entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings," submitted by Calcoast Analytical Labs for a total amount not to exceed $74,850.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $74,850.

I hereby certify that the above is a true and correct copy of Resolution 86-55 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (10)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1394-125 entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings"

RECOMMENDATION: Adopt Resolution 86-55 approving Proposal No. 1394-125 for funding in an amount not to exceed $74,850.

SUMMARY: Many local air pollution control districts have adopted regulations limiting the amount of photochemically reactive organic compounds contained in coatings for metal parts. However, it is uncertain whether low-solvent coatings that meet district regulations can provide acceptable performance.

The objectives of this study are to obtain from paint manufacturers and suppliers a range of metal coating products which meet the solvent limits of district rules, and to compare the performance of those coatings against traditional high-solvent products to see if substitution of coatings is possible without significant compromise of performance.

Calcoast would test coatings using a protocol that conforms to applicable ASTM procedures, military specifications, where appropriate, and Federal Test Method Standards (141B) for coatings and solvents. Following these protocols, Calcoast will determine specified physical properties, composition and coating performance by various measures.

This study would be conducted by Calcoast Analytical Labs and the principal investigator would be D. Patrick Fairley, and Calcoast would be assisted by its consultant, Mr. Ron Joseph.

State of California
AIR RESOURCES BOARD

Resolution 86-56

May 22, 1986

Agenda Item No.: 86-6-1

WHEREAS, major interruptions in petroleum supply in the 1973-1974 time period and in 1979 have stimulated interest in fuel altenatives to improve fuel security in California;

WHEREAS, the detrimental effects of increased population growth and vehicle use on California's air quality has stimulated interest in clean burning fuel alternatives to gasoline and diesel fuels;

WHEREAS, the broad consensus of air quality experts, energy experts, and automotive manufacturers is that methanol is the most viable alternative to petroleum-based fuels, since methanol is clean burning and an adequate supply of methanol can be obtained from coal to supply a significant portion of the California vehicle fleet for many years;

WHEREAS, in 1984 a panel consisting of members of the Air Resources Board (ARB), California Energy Commission (CEC), and South Coast Air Quality Management District (SCAQMD) chaired a symposium on the use of methanol as an alternative fuel in California's South Coast Air Basin, as well as in other areas of the state;

WHEREAS, in 1984 members of the methanol fuel symposium panel directed their respective staffs to establish a joint Task Force to develop an action plan to guide their agencies' involvement in the air quality evaluation and commercialization of methanol as a fuel in California;

WHEREAS, improved air quality has been given the highest priority in terms of developing the Methanol Task Force action plan;

WHEREAS, in 1986 a report was developed by the Methanol Task Force which describes the action plan for specific research, technology development, and demonstration projects considered necessary for the air quality evaluation and commercialization of methanol as a motor fuel;

WHEREAS, the Methanol Task Force Report has concluded that air quality benefits can be derived from methanol fuel usage since the reactivity of methanol vehicle exhaust is significantly lower than gasoline vehicle exhaust, benzene emissions are extremely low in methanol vehicle exhaust, and particulate emissions from methanol-fueled diesel engines are virtually nonexistent;

WHEREAS, the Methanol Task Force Report has identified a number of barriers to methanol commercialization in terms of developing methanol technology (engines which can burn methanol on a par with current gasoline- and diesel-powered engines), establishing a methanol fueling network (the methanol equivalent of gas stations), establishing a limited transportation system for bringing methanol into California, and resolving the economic uncertainties associated with the use of methanol as a motor fuel;

WHEREAS, the Methanol Task Force Report recommends six projects that have been specifically developed as a response to the barriers which currently exist to the full commercialization of methanol as a fuel;

WHEREAS, the Board finds that:

Use of methanol as a substitute for gasoline and diesel fuel will result in a significant air quality improvement in the South Coat Air Basin and throughout other regions in the state;

Major barriers to methanol commercialization as identified in the Methanol Task Force Report must be removed before methanol can become an integral part of California's state and regional air quality plans;

Each project recommended in the Methanol Task Force Report represents a positive step towards the eventual commercialization of methanol as a motor fuel in California.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the recommendations in the Methanol Task Force Report for the purpose of developing methanol technology and stimulating commercialization of methanol as a motor fuel for the California vehicle fleet.

BE IT FURTHER RESOLVED that the Board directs the staff to continue to participate on the Task Force, and periodically report back to the Board with the results of ongoing projects and with recommendations for future activities.

I hereby certify that the above is a true and correct copy of Resolution 86-56, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Resolution 86-57
May 22, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1426-126b, entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations," has been submitted by AeroVironment, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1426-126b, entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations," submitted by AeroVironment, Inc. for an amount not to exceed $540,500.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1426-126b, entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations," submitted by AeroVironment, Inc. for an amount not to exceed $540,500.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $540,500.

I hereby certify that the above is a true and correct copy of Resolution 86-57 as adopted by the Air Resources Board.

Utako Kimura

for Harold Holmes, Board Secretary

ITEM NO.: 86-6-4 (b)(11)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-126b entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations"

RECOMMENDATION: Adopt Resolution 86-57 approving proposal 1426-126b for funding in an amount not to exceed $540,500.

SUMMARY: The Air Resources Board is sponsoring a multi-year integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July of 1987. The overall objective of that program is to develop a comprehensive meteorologic and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. The backbone of the study is a network of approximately nine specially equipped air quality monitoring stations located throughout the basin in such a way as to permit detailed study of an air parcel from offshore at a site such as San Nicolas Island, through areas of heavy mobile source and industrial emissions, along a trajectory ending at a far downwind receptor area such as Riverside.

To accomplish this task in a cost-effective manner, existing air quality monitoring stations operated by the South Coast Air Quality Management District will be equipped with additional instrumentation and equipment to make detailed measurements of both primary and secondary gaseous pollutants and reaction intermediates and of the the detailed composition of size-resolved aerosol particles.

The purpose of this contract is to provide for the design of a prototype air quality monitoring station, and upon satisfactory building and demonstration of the prototype by STI under a separate, complementary project, and in cooperation with Combustion Engineering (to be funded under a separate contract), to install the equipment in up to nine existing SCAQMD stations; to acquire and train personnel to operate the stations; and to collect samples during the two intensive sampling periods, one during the summer of 1987 and the other during the late fall/early winter of 1987-88. The contractors will write a final report and prepare a computer-readable data base of meteorologic and aerometric data collected under the terms of this contract.

The principal investigator for AeroVironment is Mr. Michael Chan.

B U D G E T S U M M A R Y

AeroVironment

"South Coast Air Quality Study: Installation and Operation of Type B Stations"

	TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 7	TOTAL
1. Direct Labor	2,642	11,793	28,514	19,014	60,306	16,833	139,105
2. D.L.O. (120% of #1)	3,170	14,152	34,217	22,820	73,367	20,200	166,926
3. Materials*	0	7,500	10,200	0	3,300	0	21,000
4. Transportation**	0	100	6,600	1,400	6,100	1,000	15,200
5. Per Diem**	0	0	750	0	6,750	0	7,500
6. Temporary Labor***	0	0	0	9,000	47,920	0	56,920
7. G & A (20% of 1 thru 6)	1,162	6,709	16,056	10,447	39,349	7,607	81,330
8. Fee (9% of 1 thru 7)	628	3,623	8,670	5,642	21,248	4,108	43,918
9. Equipment Use ****					8,600		8,600
TOTAL	7,603	43,876	105,007	68,327	265,940	49,747	540,500

*MATERIALS
- TASK 2: Use of aerosol calibration system $3,000
  Misc. materials and parts $200/station x 9 stations = $1800
- TASK 3: Misc. site preparation costs $500/site x 9 sites = $4,500
  Packing and shipping to return borrowed equipment $2,000
  Calibration gases $900
  Misc. supplies $200/site x 9 sites = $1,800
  Spare/repair parts $1,000
- TASK 5: Misc. operating supplies $200/site x 9 sites = $1,800

**TRANSPORTATION
- TASK 2: Truck rental $100
- TASK 3: Air fare to offshore island monitoring site
  6 rt at $100 = $600
  Mileage 10,000 miles @ .50/mile = $5,000
  Truck rental $1,000
  Per Diem 10 days @ $75/day = $750
- TASK 4: Air fare to offshore island monitoring site
  4 rt at $100 = $400
  Mileage 2,000 miles @ .50/mile = $1,000
- TASK 5: Air fare to offshore island monitoring site
  8 rt at $100 = $800
  Mileage 10,000 miles @ .50/mile = $5,000
  Vehicle rental 6 days @ $50/day = $300
  Per Diem 90 days @ $75/day = $6,750
- TASK 7: Air fare 5 rt to Sacramento @ $150 = $750
  Car rental 5 days @ $50 = $250

***TEMPORARY LABOR
- TASK 4: Training of site technicians 600 hrs. @ $15/hr=$9,000
- TASK 5: Site Technicians 2,528 hrs. @ $15/hr = $37,920
  Overtime premium 800 hrs @ $5/hr+
  800 hrs @ $7.50/hr = $10,000

*** EQUIPMENT USE
- TASK 5: VAX Computer 38 CPU hrs @ $150/hr + 380 connect hrs. @ $5/hr = $7,600
  Mass flow calibrators for QA = $1,000

SUMMARY OF TASKS

AeroVironment, Inc.

"Southern California Air Quality Study: Installation and Operation of Type B Stations"

Task 1 - Program Plan

Review and help finalize Type B site program plan.

Task 2 - Aerosol Sizing and Data Acquisition Systems

Help design prototype system.

Install and test for one week prototype system at Type B site after STI/EMSI have finalized and lab tested design.

Construct and test eight duplicates of prototype system with equipment provided by EMSI.

Task 3 - Site Preparation

Survey and prepare nine sites assuming SCAQMD provides adequate space and power.

Install and test eight additional sites for summer study.

Tear down all sites (4 after summer study, 5 after winter study).

Task 4 - Training

Prepare station operation manuals and SOPs.

Train site operators for summer and winter study.

Task 5 - Operation

Operate 9 Type B sites in summer study for up to 12 measurement days in a six-week period and 5 Type B sites in winter study for up to 7 measurement days in a four-week period.

Process continuous and analytical data, eliminating invalid data based on site operations, and produce data set in format specified by ARB.

Task 7 - Project Meetings

Attend 6 project meetings at AV and 5 meetings at ARB, Sacramento.

State of California
AIR RESOURCES BOARD

Resolution 86-58

June 19, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 112-17, entitled "Integrated Soil Processes Studies at Emerald Lake Watershed," has been submitted by the University of California, Riverside, to the ARB; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 112-17, entitled "Integrated Soil Processes Studies at Emerald Lake Watershed," submitted by the University of California, Riverside, for a total amount not to exceed $265,206.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 112-17, entitled "Integrated Soil Processes Studies at Emerald Lake Watershed," has been submitted by the University of California, Riverside, for a total amount not to exceed $265,206.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $265,206.

I hereby certify that the above is a true and correct copy of Resolution 86-58 as adopted by the Air Resources Board

Harold Holmes, Board Secretary

ITEM NO.: 86-7-4(b)1
DATE: June 19, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 112-17 entitled "Integrated Soil Processes Studies at Emerald Lake Watershed."

RECOMMENDATION: Adopt Resolution 86-58 approving Proposal No. 112-17 for funding in an amount not to exceed $265,206.

SUMMARY: The Integrated Watershed Study (IWS) at Emerald Lake, Sequoia National Park was initiated by the Air Resources Board in 1984 to investigate the sensitivity of a representative high-elevation watershed to acid deposition. Soil processes in the watershed were investigated by researchers from the University of California, Riverside at the IWS site during the 1984-85 field seasons. The U.C. Riverside group is now requesting funding for an additional 24-month study at the IWS site to continue and expand soil processes research. The objectives of this study are: (1) to continue long-term biological and soil processes studies; (2) to obtain solute transport, biological and chemical data required for integration of soil processes data with vegetation and hydrologic processes data; and (3) to integrate soil process data with recently acquired mapping data to estimate budgets of nitrogen, sulfur, phosphorus and aluminum for the watershed. These data will provide the ARB with information on soil processes that may be changing due to acid inputs. It is also important to collect these data so that the influences on surface water quality can be estimated.

This research project will include field collection of physical, chemical and biological data on soils and laboratory experiments designed to model important processes that can be verified in the field. These data can be used to construct a model that describes this representative, subalpine system and predicts changes that may be attributed to acid deposition.

The principal investigators for this research project include: Drs. L. Lund, M. Lueking, A. Brown and S. Nodvin.

BUDGET SUMMARY

University of California, Riverside

"Integrated Soil Processes Studies at Emerald Lake Watershed"

BUDGET ITEMS:

Salaries	$157,699
Benefits	40,893
*Supplies	13,000
**Equipment	6,500
Other Costs	--
***Travel	23,595

TOTAL, Direct Costs	$241,687
TOTAL, Indirect Costs (10% of $235,187)	23,519
TOTAL PROJECT COST	$265,206

* Supplies include field apparatus, laboratory supplies and office supplies.

** Equipment includes three electronic data loggers for field use.

*** Travel includes $20,995 for mileage charges, per diem expenses and vehicle rental for field work.

State of California
AIR RESOURCES BOARD

Resolution 86-59

June 19, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 111-17, entitled "Characterization of Year-Round Sensitivity of California's Mountain Lakes to Acidic Deposition," has been submitted by the University of California, Santa Barbara to the ARB; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 111-17, entitled "Characterization of Year-Round Sensitivity of California's Mountain Lakes to Acidic Deposition," submitted by the University of California, Santa Barbara, for a total amount not to exceed $237,658.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 111-17, entitled "Characterization of Year-Round Sensitivity of California's Mountain Lakes to Acidic Deposition," submitted by the University of California, Santa Barbara, for a total amount not to exceed $237,658.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $237,658.

I hereby certify that the above is a true and correct copy of Resolution 86-59 as adopted by the Air Resources Board

Harold Holmes, Board Secretary

ITEM NO.: 86-7-4(b)2
DATE: June 19, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 111-17 entitled "Characterization of Year-Round Sensitivity of California's Mountain Lakes to Acidic Deposition."

RECOMMENDATION: Adopt Resolution 86-59 approving Proposal No. 111-17 for funding in an amount not to exceed $237,658.

SUMMARY: The Kapiloff Acid Deposition Act requires the California Air Resources Board to assess the potential for damage to natural ecosystems of the state due to acid deposition. Since the Sierra Nevada is known to be the most sensitive region of the state, it is important to characterize the vulnerability of high-elevation lakes to acid deposition. It is also critical that episodic acidification events due to acidic precipitation in the Sierra be monitored in a number of different lake basins to understand the extent of this phenomena.

The proposal by the University of California, Santa Barbara, describes a 24-month field program to study the year-round status of four lakes in the Sierra: two on the western slope and two on the eastern slope. This project will measure precipitation inputs as rain and snow, estimate lake outflow and examine chemical and physical dynamics of lakes on a bimonthly schedule. This project is designed to document alkalinity changes that may occur in winter. Also, this sampling schedule will allow for the identification of acidic rain or snowmelt events in four different locations in the Sierra.

At the completion of this field study, the proponents will evaluate the complete set of data bases relating to lakes generated under the Kapiloff program and will recommend a long-term monitoring program for California's sensitive lakes.

The principal investigator for this project is Dr. John Melack.

BUDGET SUMMARY

University of California, Santa Barbara

"Characterization of Year-Round Sensitivity of California's Mountain Lakes to Acidic Deposition"

BUDGET ITEMS:

Salaries	$92,902	
Benefits	29,095	
*Supplies	24,676	
**Equipment	32,695	
***Other Costs	13,000	
****Travel	26,657	
TOTAL, Direct Costs		$219,025
TOTAL, Indirect Costs		18,633
	TOTAL PROJECT COST	$237,658

* Supplies include laboratory and field supplies.

** Equipment includes field instruments for the four watersheds (tipping bucket gauges, pressure transducers and electronic data loggers) and an ion chromatograph auto sampler ($10,945).

*** Other costs include publication costs, technical editing, office expenses, computer costs and stock fees.

**** Travel includes $9,600 for per diem expenses and $13,860 for mileage charges and vehicle rental for field work.

State of California
AIR RESOURCES BOARD

Resolution 86-60

June 19, 1986

Agenda Item No.: 86-7-2

WHEREAS, Health and Safety Code Section 42701 requires the Air Resources Board (the "Board") to determine the availability, technological feasibility, and economic reasonableness of monitoring devices to measure and record continuously emissions from larger stationary sources, and Section 42702 requires the Board to specify the types of stationary sources, the processes, and the contaminants for which a monitoring device is available, technologically feasible, and economically reasonable;

WHEREAS, pursuant to the Board's direction following consideration of a 1984 petition from Citizens for a Better Environment ("CBE"), the staff has evaluated the availability, technological feasibility and economic reasonableness of continuous emission monitors for oil refinery flares;

WHEREAS, based on its evaluation the staff has recommended that the Board determine that devices which monitor the on/off status of refinery flares are technologically feasible, available, and economically reasonable;

WHEREAS, the Board staff has further recommended that the Board:

Encourage local air pollution control districts in which refinery flares are located to adopt rules requiring refiners to install refinery flare on/off monitors;

Direct the staff to work, as necessary, with industry and the districts to develop rules requiring the use of these devices with workable but standardized definitions of "on" and "off";

Encourage the districts to require, pursuant to Health and Safety Code Section 42303, refiners to provide grab sample composition analyses of flare feed stream gases;

Direct the staff, after sufficient on/off data and coordinated composition data have been collected, to evaluate such data and develop recommendations regarding the development of a Suggested Control Measure for the control of refinery flare emissions if the staff's evaluation indicates that such control is reasonable;

WHEREAS, pursuant to Health and Safety Code Sections 39002 and 40000, the districts have the primary responsibility in California for control of air pollution from nonvehicular sources;

WHEREAS, Health and Safety Code Section 41511 authorizes a district, for the purpose of carrying out its duties, to adopt rules requiring the owner or operator of any emission source to take such action, including installation of continuous emission monitors, as the district finds to be reasonable for determining the amount of emissions from the source;

WHEREAS, Health and Safety Code Section 43203 authorizes a district air pollution control officer at any time to require from a permit holder information which will disclose the nature, extent, quantity, or degree of air contaminants which are discharged by the source for which the permit was granted;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, the Board finds that:

Pressure sensors, optical radiation sensors, and hot wire thermistors have been used at refineries in California to monitor the on/off status of refinery flares to the satisfaction of refinery personnel;

Refinery flare on/off status monitors are presently available in California from commercial vendors and would cost approximately $800 to $2000 for each installation;

Emissions of oxides of nitrogen and oxides of sulfur from refinery flares are currently not being routinely monitored in California, and the magnitude of flare emissions has not been determined accurately because of the technical problems associated with flare emission monitoring;

Records of the frequency and duration of flare operations made by flare on/off monitoring devices, coupled with composition data from analysis of grab samples of refinery flare gas streams, can be combined with existing information about refinery processes and flares to yield improved emissions estimates;

Standardized definitions of "on" and "off" for refinery flare on/off status monitors would enhance the usefulness of the data from such monitors;

The actions recommended by the staff will have no adverse environmental impact;

WHEREAS, the Board has conducted a public meeting to consider the staff recommendations and has received and considered written and oral presentations from any members of the public wishing to comment.

NOW, THEREFORE, BE IT RESOLVED that the Board determines that monitoring devices are technologically feasible, available, and economically reasonable to identify and record continuously the on/off status of refinery flares for the purpose of determining refinery flare emissions.

BE IT FURTHER RESOLVED that the Board encourages local air pollution control districts in which refinery flares are located to adopt rules requiring refiners to install refinery flare on/off monitors.

BE IT FURTHER RESOLVED that the Board directs the staff to work, as necessary, with industry and the districts to develop rules requiring the use of these devices with workable but standardized definitions of "on" and "off."

BE IT FURTHER RESOLVED that the Board encourages districts to require, pursuant to Health and Safety Code Section 42303, refiners to provide grab sample composition analyses of flare feed stream gases.

BE IT FURTHER RESOLVED that the Board directs the staff to report to the Board in six months on the progress of the districts in developing and adopting rules requiring refiners to use on/off status flare monitors and to submit grab sample composition analyses of flare feed stream gases, and directs the staff to report thereafter as appropriate on the implementation and results of flare monitoring requirements.

BE IT FURTHER RESOLVED that the Board directs the staff, after sufficient on/off data and coordinated composition data have been collected, to evaluate such data and develop recommendations regarding the development of a Suggested Control Measure for the control of refinery flare emissions if the staff's evaluation indicates that such control is reasonable.

I hereby certify that the above is a true and correct copy of Resolution 86-60, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

86-61
Missing Resolution

86-62
Missing Resolution

State of California
AIR RESOURCES BOARD

Resolution 86-63

June 19, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1409-126, entitled "A Quantitative Assessment of the Air Quality Effects of Methanol Fuel Use," has been submitted by the Carnegie-Mellon University;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Division has reviewed and recommends for funding:

> Proposal Number 1409-126, entitled "A Quantitative Assessment of the Air Quality Effects of Methanol Fuel Use," submitted by Carnegie-Mellon University for a total amount not to exceed $149,965.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1409-126, entitled "A Quantitative Assessment of the Air Quality Effects of Methanol Fuel Use," submitted by Carnegie-Mellon University for a total amount not to exceed $149,965.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $149,965.

I hereby certify that the above is a true and correct copy of Resolution 86-63 as adopted by the Air Resources Board

Harold Holmes, Board Secretary

ITEM NO.: 86-7-4 (b) (3)
DATE: June 19, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1409-126 entitled "A Quantitative Assessment of the Air Quality Effects of Methanol Fuel Use."

RECOMMENDATION: Adopt Resolution 86-63 approving Proposal No. 1409-126 for funding in an amount not to exceed $149,965.

SUMMARY: The ARB has been evaluating methanol as an alternative motor vehicle fuel because of its potential for improving air quality in the SCAB. Preliminary studies of the impact of methanol use on air quality have been criticized by reviewers who are concerned about the validity of some major assumptions and about the emission factors that have been used in these estimates. The purpose of this project is to provide improved estimates of the air quality changes that would take place in the South Coast Air Basin (SCAB) as a result of varying levels of methanol fuel use. These estimates will be provided for the years 2000 and 2010.

An air quality simulation model will be used to provide these estimates. Uncertainity analysis will be performed on the modeling results and a plan formulated to reduce these uncertainities.

BUDGET SUMMARY

Carnegie-Mellon University

"A Quantitative Assessment of the Air Quality Effects of Methanol Fuel Use"

BUDGET ITEMS:

Salaries	$76,760		
Transportation	5,667		
Computer Usage	10,000		
Publication & Misc.	5,400		
Consulting*	7,500		
TOTAL, Direct Costs			$105,327
TOTAL, Indirect Costs			44,638
		TOTAL PROJECT COST	$149,965

* RSC recommends that up to $7500 be added for a consultant on emissions of methanol powered vehicles.

State of California
AIR RESOURCES BOARD

Resolution 86-64
July 24, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1425-126, entitled "Economic Impact of Air Pollution on Forested Areas of California: Phase I, Data Base, and Ranking of Forest Sensitivity," has been submitted by Energy and Resource Consultants, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1425-126, entitled "Economic Impact of Air Pollution on Forested Areas of California: Phase I, Data Base, and Ranking of Forest Sensitivity," submitted by Energy and Resource Consultants, Inc., for a total amount not to exceed $88,895.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1425-126, entitled "Economic Impact of Air Pollution on Forested Areas of California: Phase I, Data Base, and Ranking of Forest Sensitivity," submitted by Energy and Resource Consultants, Inc., for a total amount not to exceed $88,895.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $88,895.

I hereby certify that the above is a true and correct copy of Resolution 86-64, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-8-4(b)1
DATE: July 24, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1425-126 entitled "Economic Impact of Air Pollution on Forested Areas of California: Phase I, Data Base, and Ranking of Forest Sensitivity."

RECOMMENDATION: Adopt Resolution 86-64 approving Proposal No. 1425-126 for funding in an amount not to exceed $88,895.

SUMMARY: This research project constitutes Phase I of an assessment of air pollution damage to California Forests. The project objectives are: 1) to compile a data base describing forest resources; 2) to develop and apply a scheme to rank forest areas for sensitivity to ozone and sulfur dioxide and to couple this ranking with measured or estimated air quality data to produce a ranking of forest areas at highest risk from pollution; and 3) to examine the policies of governmental agencies that manage forest areas to analyze and report on apparent conflicts between forest management policies and the prevention of air pollution damage to forests. Phase II, which is outside the scope of the RFP, will use information gathered in Phase I and in subsequent field studies to evaluate current and potential economic damage to forests.

In accordance with the State Health and Safety Code, this research project will provide a data base and a risk assessment of the effects of air pollution on forests for eventual economic analyses to assist the Board in determining the consequences of various alternative solutions to specific air pollution problems and in adopting standards in consideration of the public welfare, including, effects on the economy, in its effort to combat air pollution.

The principal investigator would be Dr. Robert Rowe.

withdrawn at Board Hearing

State of California
AIR RESOURCES BOARD

Resolution 86-65
July 24, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1408-126, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," has been submitted by Energy and Environmental Analysis, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1408-126, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," submitted by Energy and Environmental Analysis, Inc., for a total amount not to exceed $39,830.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1408-126, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," submitted by Energy and Environmental Analysis, Inc., for a total amount not to exceed $39,830.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $39,830.

ITEM NO.:
DATE: July 24, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1408-126 entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California."

RECOMMENDATION: Adopt Resolution 86-65 approving Proposal No. 1408-126 for funding in an amount not to exceed $39,830.

SUMMARY:

Approximately ten percent of the heavy-duty vehicles (HDVs) registered in the U. S. are based in California. As at the national level, HDVs in California encompass a broad range of weight categories and major use applications in both urban and rural areas of the state. Of primary interest to the ARB are: 1) the contribution of these HDV classes to emissions and air quality in urban areas, and 2) the contribution of trucks based outside the state to emission inventories in California. The 1982 Truck Inventory and Use Survey (TIUS) data collected by the U. S. Bureau of the Census, with other information and some data processing, can be used to address these concerns.

The contractor proposes to perform data analysis on the 1982 Truck Inventory and Use Survey and other related reports to provide information relative to California's HDV fleet technology mix, usage patterns and distribution. They are currently analyzing the national data to provide similar estimates for the EPA.

Data provided by this study would be used by the ARB staff to upgrade the State's emission inventory for HDVs and to assist in promulgating future emission standards and/or an inspection and maintenance program for HDV's.

The principal investigator would be Mr. K. G. Duleep.

State of California
AIR RESOURCES BOARD

Resolution 86-66
July 24, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1429-127, entitled "Engineering Evaluation and Control of Toxic Airborne Effluents," has been submitted by the University of California, Davis;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1429-127, entitled "Engineering Evaluation and Control of Toxic Airborne Effluents," submitted by the University of California, Davis, for a total amount not to exceed $76,374.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1429-127, entitled "Engineering Evaluation and Control of Toxic Airborne Effluents," submitted by the University of California, Davis, for a total amount not to exceed $76,374.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $76,374.

I hereby certify that the above is a true and correct copy of Resolution 86-66, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-8-4(b)3
DATE: July 24, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1429-127 entitled "Engineering Evaluation and Control of Toxic Airborne Effluents."

RECOMMENDATION: Adopt Resolution 86-66 approving Proposal No. 1429-127 for funding in an amount not to exceed $76,374.

SUMMARY: Faculty and graduate students of the College of Engineering, University of California, Davis have been assisting the staff of the Air Resources Board's Stationary Source Division in laboratory studies concerning the development and evaluation of control and measurement methods for toxic air pollutants. In pursuing these activities, the University has also provided a "test site" where on-campus laboratory facilities and expertise in relevant disciplines are made available to the ARB staff. Originally, a lack of laboratory facilities available to staff for conducting research and development studies, especially involving toxic compounds at concentrations anticipated under field test conditions, prompted this joint effort with the University.

The current proposal presents the third in a series of studies of mutual interest to both the ARB and the University. The 1985-86 program involved a study of the feasiblity of a pilot scale waste incinerator to determine thermal destruction and removal efficiency (DRE) for toxic compounds and surrogates; a review of literature on hazardous waste surrogate compound DRE; the measurement of single component parameters for an oil production sump emissions model; incorporation of latent heat effects into the emissions model; and an initial study of emissions from land farming operations. These studies are complete and the results will be reported soon.

UCD now proposes to expand the 1985-86 efforts to investigate combustion mechanisms of toxic waste incineration; to extend the single component oil sump emissions model to the multicomponent case, including the effects of residence time upon multicomponent transport; and to determine synergistic relationships between the biological activity of bacterial colonies

and oily wastes, and the rate of loss of waste organic compounds as a function of temperature, soil loadings, soil water content, etc. in land farming operations.

These studies are designated to provide ARB staff with cost effective support in resolving certain technical problems associated with permit evaluation, risk assessment and emissions estimation. The principal investigators would be Drs. D. P. Chang, C. K. Lau, and Richard Bell.

BUDGET SUMMARY

University of California, Davis

"Engineering Evaluation and Control of Toxic Airborne Effluents"

BUDGET ITEMS:

Salaries	$46,081	
Benefits	3,500	
Travel	1,360	
Equipment (chemical reagents, standards, surrogates)	5,630	
Analytical Cost	4,000	
Equipment for single drop combuster	8,900	
Reports	770	
TOTAL, Direct Costs		$70,241
TOTAL, Indirect Costs		6,133
	TOTAL PROJECT COST	$76,374

State of California
AIR RESOURCES BOARD

Resolution 86-67
July 24, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a proposed program plan, Number 1431-127, entitled "Crop Loss from Air Pollutants Assessment Program," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1431-127, entitled "Crop Loss from Air Pollutants Assessment Program," submitted by the University of California, Riverside, for a total amount not to exceed $97,954.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1431-127, entitled "Crop Loss from Air Pollutants Assessment Program" submitted by the University of California, Riverside, for a total amount not to exceed $97,954.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $97,954.

I hereby certify that the above is a true and correct copy of Resolution 86-67, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-8-4(b)4
DATE: July 24, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1431-127 entitled " Crop Loss from Air Pollutants Assessment Program"

RECOMMENDATION: Adopt Resolution 86-67 approving Proposal No. 1431-127 for funding in an amount not to exceed $97,954.

SUMMARY: Agricultural crop losses due to air pollution are known to occur in California. Estimates of economic losses vary from $150 million to $1 billion annually. A sounder information base is needed to improve estimates of these losses, and to assess the biological and economic impacts of air pollution levels expected to result from proposed regulatory decisions and actions.

In January 1985, the Air Resources Board initiated a program to develop estimates, on a statewide basis, of crop losses caused by current levels of ambient oxidants. This program is now being carried out through the University of California, Riverside. The first set of preliminary crop loss estimates, for 1984, was presented to ARB staff at a recent workshop.

Project activities for the 1986-87 fiscal year include revising the presentation of preliminary crop loss estimates in light of comments received during the workshop. During the winter of 1986-87, the investigators will visit the county agricultural commissioners to discuss the 1984 assessment and its data bases in order to take into account any additional input which the county agricultural commissioners can provide. The investigators will prepare an assessment for 1985, identify critical data gaps, and conduct limited short term experiments to provide the needed information.

The Program in Crop Loss Assessment expects to provide improved and more realistic assessments than are now available of air pollution damage to important California crops. These assessments will provide a firm basis for estimates of economic losses suffered by growers and consumers as a result of ambient levels of air pollution, and will be helpful in estimating long term effects of alternative proposed regulatory decisions and actions. In addition the program furnishes an excellent source of guidance for the extramural research program.

State of California
AIR RESOURCES BOARD

Resolution 86-68

July 24, 1986

Agenda Item No.: 86-8-1

WHEREAS, Health and Safety Code Sections 39600 and 39601 authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Health and Safety Code Section 43104 authorizes the Board to adopt test procedures for determining whether new motor vehicles and new motor vehicle engines are in compliance with vehicular emission standards adopted by the Board, and provides that the Board shall base its test procedures on federal test procedures or on driving patterns typical in the urban areas of California;

WHEREAS, the Board's present passenger car, light-duty truck, and medium-duty vehicle exhaust emission test procedures, and associated certification requirements, are set forth in the "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" as last amended October 2, 1985, incorporated by reference in Section 1960.1, Title 13, California Administrative Code;

WHEREAS, the Board's present test procedures are largely based on Environmental Protection Agency (EPA) federal certification test procedures contained in Title 40, Code of Federal Regulations, Part 86, Subparts A and B, as the federal procedures existed April 15, 1978 with reference to gasoline-powered vehicles and October 13, 1981 with reference to diesel-powered vehicles;

WHEREAS, the EPA has since April 15, 1978 promulgated various changes to the federal certification procedures;

WHEREAS, the staff has proposed amendments to the Board's exhaust emission test procedures for passenger cars, light-duty trucks, and medium-duty vehicles, and associated certification requirements, which generally update the test procedures and requirements applicable to the 1988 and later model years to incorporate the federal test procedures reflecting recent amendments adopted by EPA while establishing separate California requirements where necessary and appropriate;

WHEREAS, the amendments proposed by staff would separate the existing exhaust emission standards and test procedures for 1984 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles into one set for the 1984 through 1987 model years and another set for the 1988 and subsequent model years, and would update references to weight specifications in Title 13, California Administrative Code, Sections 1960.1 and 1960.1.5;

WHEREAS, on April 25, 1986 the Board approved amendments to Title 13, California Administrative Code, Sections 1960.1 and Sections 1960.1.5 and to the incorporated test procedures, and those amendments are not yet in effect;

WHEREAS, the California Environmental Quality Act and Board regulations require that an action not be adopted as proposed where it will have significant adverse environmental impacts and alternatives or feasible mitigation measures to the proposed action are available which would substantially reduce or avoid such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code; and

WHEREAS, the Board finds that:

The amendments set forth in Attachments A through D more closely parallel the most recent federal test procedures and will reduce the certification costs and administrative burdens of vehicle manufacturers;

The amendments set forth in Attachments A through D will make necessary and appropriate improvements to the passenger car, light-duty truck, and medium-duty vehicle test procedures and associated certification requirements; and

Attachment E shows portions of the amendments contained in Attachments A through D in conjunction with the amendments approved April 25, 1986, and includes changes to the amendments approved April 25, 1986 which are appropriate and necessary to ensure the internal consistency of the Board's regulations; and

The attached amendments will not result in any significant adverse environmental impacts.

NOW, THEREFORE, BE IT RESOLVED that the Board approves the amendments to Title 13, California Administrative Code, Sections 1960.1 and 1960.1.5, set forth in Attachments A and B hereto.

BE IT FURTHER RESOLVED that the Board approves the amendments to the "California Exhaust Emission Standards and Test Procedures for 1981 through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" set forth in Attachment C hereto.

BE IT FURTHER RESOLVED that the Board approves the "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" set forth in Attachment D hereto.

BE IT FURTHER RESOLVED that the Board approves the amendments set forth in Attachment E hereto.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the amendments set forth in Attachments A, B, C, and D, with the modifications in Attachment E if prior to adoption the Office of Administrative Law has approved the amendments approved by the Board April 25, 1986, after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the amendments to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board hereby determines that the amendments approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards, will not cause the California requirements to be inconsistent with Section 202(a) of the Clean Air Act, and raise no new issues affecting previous waiver determinations of the Administrator of the EPA pursuant to Section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall forward the amended regulations to the EPA with a request for confirmation that the amendments are within the scope of an existing waiver pursuant to Section 209(b)(1) of the Clean Air Act.

I hereby certify that the above is a true and correct copy of Resolution 86-68, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Amendments to Regulations Regarding Certification Test Procedures Applicable to Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles

Agenda Item No.: 86-8-1

Public Hearing Date: July 24, 1986

Response Date: May 4, 1987

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: Harold Holmes
Board Secretary

Date: May 27, 1987

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : **Air Resources Board**

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-68
86-70
86-71
86-94
86-98
86-99
86-115
87-9
87-61
87-62
87-66
88-1
88-8

ATTACHMENT A

PROPOSED

Amend Title 13, California Administrative Code, Section 1960.1, subsections (d) and (h), to read as follows:

1960.1 Exhaust Emission Standards and Test Procedures--1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

(d)(1) The exhaust emissions from new 1984 ~~and subsequent~~ through 1987 model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed:

1984 THROUGH 1987 EXHAUST EMISSIONS STANDARDS(6)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.) (2)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons (3)	Carbon Monoxide	Oxides of Nitrogen (4)
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC(5)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV (5)	0-3999	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)	4000-5999	100,000	0.50 (0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

(5) This set of standards for 1984 through 1987 ~~1988 and later~~ model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section ~~1960.15.~~ 1960.1.5.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, and 0.2 g/mi for the 1986 ~~through 1988~~ and 1987 model years~~, and 0.08 g/mi for the 1989 and subsequent model years~~. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(2) The exhaust emissions from new 1988 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed:

1988 AND SUBSEQUENT EXHAUST EMISSIONS STANDARDS(5)
(grams per mile)

Vehicle Type(1)	Loaded Vehicle Weight (lbs.)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(2)	Carbon Monoxide	Oxides of Nitrogen (3)
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC(4)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3750	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV (4)	0-3750	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3750	100,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3750	100,000	0.46	10.6	1.0
LDT,MDV	3751-5750	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)	3751-5750	100,000	0.50 (0.50)	9.0	1.5
MDV	5751 & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	5751 & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(3) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

(4) This set of standards is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1950.1.5.

(5) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to a particulate exhaust emission standard of 0.2 g/mi for the 1988 model year, and 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(h) The test procedures for determining compliance with these standards are set forth in "California Exhaust Emission Standards and Test Procedures for 1981 ~~and Subsequent~~ through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles", adopted by the state board on November 23, 1976, as last amended ~~October 2, 1985~~ _____, and in "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," adopted by the state board on _____, 1986.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43101 and 43104, Health and Safety Code. Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43101.5, 43102, 43104, 43106 and 43204, Health and Safety Code.

ATTACHMENT B

PROPOSED

Amend Title 13, California Administrative Code, Section 1960.1.5, subsections (a) and (b), to read as follows:*

1960.1.5 Optional NOx Standards for 1983 and Later Model Passenger Cars and Light-Duty Trucks and Medium-Duty Vehicles less than 4000 lbs. Equivalent Inertia Weight (EIW) or 3751 lbs. Loaded Vehicle Weight (LVW).

(a) Notwithstanding any other provision of this chapter, a vehicle manufacturer may choose to certify 1983 and later model vehicles to optional NOx standards as follows:

Passenger cars - 0.7 gm/mile - 1983 and Subsequent Model Years. LDT, MDV 0-3999 pounds EIW - 1.0 gm/mile - 1983 ~~and Subsequent~~ through 1987 Model Years. LDT, MDV 0-3750 lbs. LVW - 1.0 gm/mile - 1988 and Subsequent Model Years.

(b) Testing of vehicles certified under this section shall be conducted in accordance with the California Exhaust Emission Test Procedures applicable to either 1981 through 1987 or 1988 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles certified to the primary California Standards for 50,000 miles.

NOTE: Authority cited: Sections 39600, ~~and~~ 39601, 43013, and 43101, Health and Safety Code. Reference: Sections 39002, 39003, 43000(e), 43013, 43100, 43101, 43101.5, 43104, and 43106 Health and Safety Code.

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* Sections 1960.1.5 (c) and (d) would remain in effect and are not changed by the above proposal.

ATTACHMENT C

PROPOSED

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1981-~~AND SUBSEQUENT~~ THROUGH 1987 MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

Adopted: November 23, 1976
Adopted: December 14, 1976
Amended: May 26, 1977
Amended: June 8, 1977
Amended: June 22, 1977
Amended: September 20, 1977
Amended: January 15, 1978
Amended: March 1, 1978
Amended: April 10, 1978
Amended: May 24, 1978
Amended: February 9, 1979
Amended: May 22, 1979
Amended: March 5, 1980
Amended: March 26, 1980
Amended: August 27, 1980
Amended: August 28, 1980
Amended: December 2, 1980
Amended: May 20, 1981
Amended: October 27, 1981
Amended: November 19, 1981
Amended: July 1, 1982
Amended: August 26, 1982
Amended: March 9, 1983
Amended: January 5, 1984
Amended: October 2, 1985
Amended: 1986

Note: These procedures are printed in a style to indicate the proposed changes. Text proposed to be added is underlined and strikeout indicates text proposed to be deleted. Headings which are underlined are not new. Additions to headings are shown by double underlines.

CALIFORNIA EXHAUST EMISSION
STANDARDS AND TEST PROCEDURES
FOR 1981-~~AND-SUBSEQUENT~~ THROUGH 1987
MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS
AND MEDIUM-DUTY VEHICLES

The provisions of Subparts A and B, Part 86, Title 40, Code of Federal Regulations, as they existed on April 15, 1978, are hereby adopted as the California Exhaust Emission Standards and Test Procedures for 1981 ~~and Subsequent~~ through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, with the following exceptions and additions. The test procedures applicable to the particulate exhaust emission standards for diesel-powered vehicles are contained in 40 CFR Part 86, Subpart B, as they existed on October 13, 1981.

1. Applicability

   a. These test procedures are applicable to 1981 ~~and subsequent~~ through 1987 model passenger cars, light-duty trucks, and medium-duty vehicles, except motorcycles. References to "light-duty trucks" in 40 CFR 86 shall apply both to "light-duty trucks" and "medium-duty vehicles" in these procedures.

   b. Any reference to vehicle sales throughout the United States shall mean vehicle sales in California.

   c. Regulations concerning EPA hearings, EPA inspections, specific language on the Certificate of Conformity, evaporative emissions, high-altitude vehicles and testing, and heavy-duty engines and vehicles shall not be applicable to these procedures, except where specifically noted.

   d. Any reference to gasoline-powered vehicles shall also apply to vehicles powered by gaseous fuels.

2. Definitions

   a. "Administrator" means the Executive Officer of the Air Resources Board.

   b. "Certificate of Conformity" means Executive Order certifying vehicles for sale in California.

   c. "Certification" means certification as defined in Section 39018 of the Health and Safety Code.

   d. "Passenger car" means any motor vehicle designed primarily for transportation of persons and having a design capacity of 12 persons or less.

   e. "Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.

f. "Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6000 pounds, except passenger cars.

g. "Light-duty truck" means any motor vehicle, rated at 6000 pounds gross vehicle weight or less, which is designed primarily for purposes of transportation of property or is a derivative of such a vehicle, or is available with special features enabling off-street or off-highway operation and use.

h. "Medium-duty vehicle" means any heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8500 pounds or less.

i. "Gaseous fuels" means liquefied petroleum gas, compressed natural gas, or liquefied natural gas fuels for use in motor vehicles.

j. "Trap oxidizer system" means an emission control system which consists of a trap to collect particulate matter and a mechanism to oxidize the accumulated particulate.

k. "Regeneration" means the process of oxidizing accumulated particulate matter. It may occur continually or periodically.

l. "Periodically regenerating trap oxidizer system" means a trap oxidizer system that utilizes an automated regeneration mode during normal driving conditions for cleaning the trap which can be easily detected.

m. "Continually regenerating trap oxidizer system" means a trap oxidizer system that does not utilize an automated regeneration mode during normal driving conditions for cleaning the trap.

n. "Non-regeneration emission test" means a complete emission test which does not include a regeneration.

o. "Regeneration emission test" means a complete emission test which includes a regeneration.

p. "Regeneration interval" means the interval from the start of a regeneration to the start of the next regeneration.

3. Test Procedures

a. In order to demonstrate compliance with a non-methane hydrocarbon emission standard, hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures."

b. Durability data submitted pursuant to subparagraph 86.078-23(f) may be from vehicles previously certified by EPA or ARB.

c. The requirements in subparagraph 86.078-28(a)(4)(i)(B) (durability vehicles must meet emission standards) refer, for each pollutant, to the highest of either the federal or California emission standards.

d. In paragraph 86.079-21 (Application for Certification), amend subparagraph (b)(5) to read:

(5) A statement of maintenance and procedures consistent with the restrictions imposed under subparagraph 86.078-25(a)(1), necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation in normal use conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

e. In paragraph 86.078-25 (Maintenance):

1. Amend subparagraph (a)(1) to read as follows:

(1) Scheduled maintenance on the engine, emission control system, and fuel system of durability vehicles shall, unless otherwise provided pursuant to paragraph (a)(5)(iii), be restricted as set forth in the following provisions.

(i) (A) for gasoline-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated:

(1) Drive belts on engine accessories (tension adjustment only); (30,000 miles).

(2) Valve lash (15,000 miles).

(3) Spark plugs (30,000 miles).

(4) Air filter (30,000 miles).

(5) Exhaust gas sensor (30,000 miles): Provided that~~;~~ ~~for 1987 and prior model years,~~ an audible and/or visible signal approved by the Executive Officer alerts the vehicle operator to the need for sensor maintenance at the mileage point.~~;~~ ~~and provided that, for 1988 and subsequent model year vehicles:~~

~~(a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is~~

again-reached-and-shall-again-remain-activated-until reset.--When-the-maintenance-indicator-consists-of-a light,-it-shall-also-activate-automatically-in-the engine-run-key-position-before-engine-cranking-to indicate-that-it-is-functioning.--The-maintenance indicator-shall-be-located-on-the-instrument-panel and-shall,-when-activated,-display-the-words-"oxygen sensor"-or-may-display-such-other-words-determined by-the-Executive-Officer-to-be-likely-to-cause-the vehicle-owner-to-seek-oxygen-sensor-replacement. The-maintenance-indicator-shall-be-separate-from-the malfunction-indicator-light-required-by-Section 1968,-Title-13,-California-Administrative-Code;

(b)-the-manufacturer-shall-provide-free-replacement of-the-oxygen-sensor,-including-both-parts-and labor,-and-shall-reset-the-maintenance-indicator without-any-charge,-the-first-time-the-maintenance interval-established-during-certification-testing-is reached-for-vehicles-certified-with-scheduled-sensor maintenance-before-50,000-miles.--If-the-oxygen sensor-is-replaced-pursuant-to-the-warranty provisions-of-Section-2037,-Title-13,-California Administrative-Code,-before-the-first-maintenance interval-is-reached,-the-manufacturer-shall-also replace-the-oxygen-sensor-and-reset-the-maintenance indicator-at-the-mileage-point-determined-by-adding the-maintenance-interval-to-the-vehicle's-mileage-at the-time-of-the-warranty-replacement.--If-the calculated-mileage-point-for-a-second-oxygen-sensor replacement-would-exceed-50,000-miles,-no-free second-replacement-shall-be-required;

(c)--The-maintenance-indicator-shall-be-resettable. The-maintenance-instructions-required-by-paragraph 3.f.-of-these-procedures-shall-provide-instructions for-the-resetting-of-the-maintenance-indicator,-and shall-specify-that-the-maintenance-indicator-shall be-reset-each-time-the-oxygen-sensor-is-replaced;-and

(d)-Notwithstanding-the-provisions-of-Section 2037(c),-Title-13,-California-Administrative-Code, the-oxygen-sensor,-including-any-replacement required-pursuant-to-this-section,-shall-be warranted-for-the-useful-life-of-the-vehicle-or engine.--If-such-oxygen-sensor-fails-during-the useful-life-period,-it-shall-be-replaced-by-the manufacturer-in-accordance-with-Section-2037(d), Title-13,-California-Administrative-Code.

(6) Choke (cleaning or lubrication only); (30,000 miles).

(7) In addition, adjustment of the engine idle speed (curb idle and fast idle), valve lash, and engine bolt torque may be performed once during the first 5000 miles of scheduled driving, provided the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

(B) for diesel-powered vehicles, maintenance shall be restricted to the following items at intervals no more frequent than every 12,500 miles of scheduled driving, provided that no maintenance may be performed after 45,000 miles of scheduled driving:

(1) Adjust low idle speed.

(2) Adjust valve lash if required.

(3) Adjust injector timing.

(4) Adjust governor.

(5) Clean and service injector tips.

(6) Adjust drive belt tension on engine accessories.

(7) Check engine bolt torque and tighten as required.

(ii) Change of engine and transmission oil, change or service of oil filter and, for diesel-powered vehicles only, change or service of fuel filter and air filter, will be allowed at the mileage intervals specified in the manufacturer's maintenance instructions.

(iii) Maintenance shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel.

(2) Delete subparagraph (a)(3) (Service of exhaust gas recirculation system).

(3) Delete subparagraph (a)(4) (Service of catalytic converter).

f. In paragraph 86.078-38 (Maintenance instructions):

1. Amend subparagraph (a) to read:

(a) The manufacturer shall furnish or cause to be furnished to the purchaser of each new motor vehicle (or motor vehicle engine) subject to the standards prescribed in paragraphs 86.078-8 through 86.078-11 as applicable, written instructions

for the maintenance and use of the vehicle (or engine) by the purchaser as may be reasonable and necessary to assure the proper functioning of emission control systems in normal use. Such instructions shall be consistent with and not require maintenance in excess of the restrictions imposed under subparagraph 86.078-25(a)(1), except that the instructions may, subject to approval by the Administrator, require additional maintenance for vehicles operated under extreme conditions. In addition, subject to approval by the Administrator, the instructions may require insoections necessary to insure safe operation of the vehicle in use. In addition to any maintenance which may be required pursuant to the preceding paragraph, the instructions may also recommend such inspections, maintenance, and repair as may be reasonable and necessary for the proper functioning of the vehicle and its emission control systems. If the instructions recommend maintenance in addition to that which may be required pursuant to the preceding paragraph, they shall distinguish clearly between required and recommended maintenance.

2. Amend subparagraph (c)(1) to read:

(1) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under subparagraph 86.078-25(a)(1).

If the instructions specify recommended maintenance as well as required maintenance, they shall distinguish clearly between the two.

3. Amend subparagraph (d) by adding a new subparagraph (3) to read:

(3) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under subparagraph 86.078-25(a)(1).

If the instructions specify recommended maintenance as well as required maintenance, they shall distinguish clearly between the two.

g. Amend subparagraph 86.078-39(a) (Submission of maintenance instructions) to read:

(a) The manufacturer shall provide to the Administrator, no later than the time of the submission required by paragraph 86.078-23, a copy of the maintenance instructions which the manufacturer proposes to supply to the ultimate purchaser in accordance with subparagraph 86.078-38(a). The Administrator will review such instructions to determine whether they are consistent with federal requirements, and to determine whether the instructions for required maintenance are consistent with the restrictions imposed under subparagraph 86.078-25(a)(1). The Administrator will notify the manufacturer of his or her determinations.

h. Amend subparagraph 86.113-78 by adding a new subparagraph (c) to read:

(c) (1) Gaseous fuels representative of commercial gaseous fuels which will be generally available through retail outlets in California or liquid petroleum gas having the ASTM D1835 or NGPA HD-5 specification shall be used in service accumulation.

(2) Liquid petroleum gas having the ASTM D1835 or NGPA HD-5 specification shall be used for exhaust and evaporative emission testing.

(3) Natural gas representative of commercial natural gas which will be generally available through retail outlets in California shall be used for exhaust emission testing.

(4) Written approval from the Administrator of the fuel specifications must be provided prior to the start of the testing.

i. Amend paragraphs 86.079-26 (Mileage and service accumulation; emission measurements) and 86.079-28 (Compliance with emission standards) to require that emission tests performed on emission-data vehicles and durability-data vehicles be non-regeneration emission tests for diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems. For any diesel passenger cars, light-duty trucks, and medium-duty vehicles equipped with continually regenerating trap oxidizer systems, manufacturers may use the provisions applicable to periodically regenerating trap oxidizer systems as an option. If such an optionis elected, all references in these Procedures to vehicles equipped with periodically regenerating trap oxidizer systems shall be applicable to the vehicles equipped with continually regenerating trap oxidizer systems.

j. Amend subparagraph 86.079-26 (a)(4)(ii) (Mileage and service accumulation; emission measurements) to read:

(ii) Diesel. Each Diesel durability-data vehicle shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objectives of this procedure. Complete emission tests (see §§ 86.106 through 86.145) shall be made at the following mileage points: 0; 5,000; 10,000; 15,000; 20,000; 25,000; 30,000; 35,000; 40,000; 45,000; and 50,000.* For diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with

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* Where applicable, the option to the above test plan set forth in the Manufacturers Advisory Correspondence #82-01A, dated April 6, 1982, may be used.

periodically regenerating trap oxidizer systems at least four regeneration emission tests (see §§ 86.106 through 86.145) shall be made. With the advance approval of the Administrator, the manufacturer may install (1) a manual override switch capable of preventing (i.e., delaying until the switch is turned off) the start of the regeneration process and (2) a light which indicates when the system would initiate regeneration if it had no override switch. Upon activation of the override switch, the vehicle will be operated on a dynamometer to precondition it for the regeneration emission test in accordance with paragraph 3.1. The Urban Dynamometer Driving Schedule (UDDS) which is in progress at the time when the light comes on shall be completed and the vehicle shall proceed to the prescribed soak period followed by testing. With the advance approval of the Administrator, the manual override switch will be turned off at some predetermined point in the testing sequence permitting the regeneration process to proceed without further manual interaction. The mileage intervals between test points shall be approximately equal. The first regeneration emission test shall be made at the 5,000 mile point, and the last shall be made at the 50,000 mile point. The regeneration emission tests must provide a deterioration factor confidence level equal to or better than the confidence level achieved by performing regeneration emission tests at the following mileage points: 5,000; 20,000; 35,000; and 50,000. The procedure for making this determination is as follows:

Select exhaust system mileage test points for proposed (prop) schedule.

Calculate the sums of the squares corrected to the mean of the system mileages at the proposed test points:

$$\Sigma (N_i'^2)_{prop} = [\Sigma (X_i^2) - \cancel{(\text{--}X)_i^2}\ \underline{(\Sigma X_i)^2}/N^i]_{prop}$$

Where:

X = Individual mileages which vehicle will be tested.

N = Total number of regeneration emission tests.

(Subscript and superscript "i" refers to proposed test schedule).

The exhaust system mileage tests points at 5,000, 20,000, 35,000, and 50,000 miles will be designated as the standard (std) test schedule.

Calculate the sums of squares corrected to the mean of the standard test schedule.

$$\Sigma (N_j'^2)_{std} = [\Sigma (X_j^2) - (\Sigma X_j)^2/N^j]_{std}$$

Where:

X = Individual mileages at which the vehicle will be tested.

N = Total number of regeneration emission tests. (Subscript and superscript "j" refers to standard test schedule)

Refer to Table I and determine t_i at $(N^i-2)_{prop}$ degrees of freedom and t_j at $(N^j-2)_{std}$.

$$\text{If } \sqrt{\Sigma (N_i')^2_{prop}} \geq \frac{t^i_{prop}}{t^j_{std}} \times \sqrt{\frac{(N^i-1)}{(N^j-1)_{std}} \Sigma (N_j')^2_{std}}$$

the proposed plan is acceptable.

Table I

Degrees of freedom N-2	t 0.050
1	6.314
2	2.920
3	2.353
4	2.132
5	2.015
6	1.943
7	1.895
8	1.860
9	1.833
10	1.812
11	1.796
12	1.782
13	1.771
14	1.761
15	1.753

k. In paragraph 86.079-28 (Compliance with emission standards):

1. Amend subparagraph (a)(4)(i) to read:

(i) Separate emission deterioration factors shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, exhaust NOx, and exhaust particulate (diesel vehicles only) for each engine-system combination. A separate evaporative emission deterioration factor shall be determined for each evaporative emission family-evaporative

emission control system combination from the testing conducted by the manufacturer (gasoline-fueled vehicles only). Separate emission correction factors (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only) shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, exhaust NOx, and exhaust particulate for each engine-system combination.

2. Add subparagraph (a)(4)(i)(D) to read:

(D) The regeneration exhaust emission data (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only) from the tests required under § 86.079-26(a)(4) shall be used to determine the regeneration exhaust emissions interpolated to the 50,000-mile point. The regeneration exhaust emission results shall be plotted as a function of the mileage on the system, rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The interpolated 50,000-mile point of this line shall be used to calculate the multiplicative exhaust emission correction factor for each engine-system combination as follows:

$$\text{Factor} = 1 + \frac{R-1}{4505} \quad n$$

where, R = the ratio of the regeneration exhaust emissions interpolated to 50,000 miles to the non-regeneration exhaust emissions interpolated to 50,000 miles.

n = the number of complete regenerations which occur during the durability test.

These interpolated values shall be carried out to a minimum of four places to the right of the decimal point before dividing one by the other to determine the correction factor. The results shall be rounded to three places to the right of the decimal point in accordance with ASTM E 29-67. For applicability to gaseous emission standards under the 100,000 option, R will be determined based upon projected 100,000 mile emissions.

3. Amend subparagraph (a)(4)(ii)(A) to read:

(A) The official exhaust emission test results for each emission-data vehicle at the 4,000 mile test point shall be multiplied by the appropriate deterioration factor, and correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically

regenerating trap oxidizer systems only): Provided: that if a deterioration factor as computed in paragraph (a)(4)(i)(B) of this section or a correction factor as computed in paragraph (a)(4)(i)(D) of this section is less than one, that deterioration factor or correction factor shall be one for the purposes of this paragraph.

l. In paragraph 86.132.78 (Vehicle preconditioning):

1. Amend subparagraph (a)(2) to read:

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and operated through one Urban Dynamometer Driving Schedule (UDDS) test procedure, see § 86.115 and Appendix I. The UDDS performed prior to a non-regeneration emission test shall not contain a regeneration (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). A gasoline fueled test vehicle may not be used to set dynamometer horsepower.

2. Amend subparagraph (a)(3) to read:

(3) For those unusual circumstances where additional preconditioning is desired by the manufacturer, such preconditioning may be allowed with the advance approval of the Administrator. The Administrator may also choose to conduct or require the conduct of additional preconditioning to insure that the evaporative emission control system is stabilized in the case of gasoline engines, or to insure that the exhaust system is stabilized in the case of diesel engines. The additional preconditioning shall consist of an initial one hour minimum soak and, one, two, or three driving cycles of the UDDS (or more in the case of a diesel-powered vehicle equipped with a periodically regenerating trap oxidizer system, which is being preconditioned for a regeneration emission test), as described in paragraph (a)(2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off. The vehicle may be driven off the dynamometer following each UDDS for the soak period.

m. The manufacturer shall record in the durability-data vehicle log book, the number of regenerations which occur during the 50,000 mile durability test of each diesel-powered passenger car, light-duty truck and medium-duty vehicle equipped with a periodically regenerating trap oxidizer system. The manufacturer shall include, for each regeneration: the date and time of the start of regeneration, the duration of the regeneration, and the accumulated mileage at the start and the end of regeneration. The number of regenerations will be used in the calculation of the correction factor in 40 CFR Part 86, Section 28.

n. Amend subparagraph § 86.144-78(a) (Calculations: exhaust emissions) to read:

The final reported test results shall be computed by the use of the following formula:

(a) For light-duty vehicles and light-duty trucks:

$$Ywm = 0.43 ((Yct + Ys)/(Dct + Ds)) + 0.57 ((Yht + Ys)/(Dht + Ds))$$

For purposes of adjusting emissions for regeneration:

$$Re = ((Yr1 - Yct) + (Yr2 - Ys) + (Yr3 - Yht))/(Dct + Ds + Dht)$$

$$Yr = Ywm^{*} + Re$$

Where:

Ywm = Weighted mass emissions of each pollutant, i.e., HC, CO, NOx or CO_2, in grams per vehicle mile.

Yct = Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.

Yht = Mass emissions as calculated from the "transient" phase of the hot start test in grams per test phase.

Ys = Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams per test phase.

Dct = The measured driving distance from the "transient" phase of the cold start test, in miles.

Dht = The measured distance from the "transient" phase of the hot start test, in miles.

Ds = The measured driving distance from the "stabilized" phase of the cold start test, in miles.

Yr = Regeneration emission test.

Re = Mass emissions of each pollutant attributable to regeneration in grams per mile.

Yr1 = Mass emissions, during a regeneration emission test, as calculated from the "transient" phase of the cold start test, in grams per test phase.

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* Ywm is derived using the emission data from a test with no regeneration.

Yr2 = Mass emissions, during a regeneration emission test, as calculated from the "stabilized" phase of the cold start test, in grams per test phase.

Yr3 = Mass emissions, during a regeneration emission test, as calculated from the "transient" phase of the hot start test in grams per test phase.

o. Amend subparagraph § 86.145-82(a) (Calculations: Particulate emissions) to read:

(a) The final reported test results for the mass particulate (Mp) in grams/mile shall be computed as follows.

$$Mp = 0.43(Mp1 + Mp2)/(Dct + Ds) + 0.57\ (Mp3 + Mp2/(Dht + Ds)$$

For purposes of adjusting emissions for regeneration:

$$Re = ((Mpr1 - Mp1) + (Mpr2 - Mp2) + (Mpr3 - Mp3))/(Dct+Ds+Dht)$$

$$Mpr = Mp^{*} + Re$$

Where:

(1) Mp1 = Mass of particulate determined from the "transient" phase of the cold start test, in grams per test phase. (See §86.110-82(c)(1) for determination.)

(2) Mp2 = Mass of particulate determined from the "stabilized" phase of the cold start test, in grams per test phase. (See §86.110-82(c)(1) for determination.)

(3) Mp3 = Mass of particulate determined from the "transient" phase of the hot start test, in grams per test phase. (See §86.110-82(c)(1) for determination.)

(4) Dct = The measured driving distance from the "transient" phase of the cold start test, in miles.

(5) Ds = The measured driving distance from the "stabilized" phase of the cold start test, in miles.

(6) Dht = The measured driving distance from the "transient" phase of the hot start test, in miles.

(7) Mpr = Regeneration emission test

(8) Re = Mass of particulate attributable to regeneration in grams/mile.

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* Mp is derived using the emission data from a test with no regeneration.

(9) Mpr1 = Mass of particulate determined, during a regeneration emission test, from the "transient" phase of the cold start test, in grams per test phase. (See § 86.110-82(c)(1) for determination.)

(10) Mpr2 = Mass of particulate determined, during a regeneration emission test, from "stabilized" phase of the cold start test, in grams per test phase. (See § 86.110-82(c)(1) for determination.)

(11) Mpr3 = Mass of particulate determined, during a regeneration emission test, from the "transient" phase of the hot start test, in grams per test phase. (See § 86.110-82(c)(1) for determination.)

4. Standards

The following standards represent the maximum projected exhaust emissions for the useful life of the vehicle.

(a) The exhaust emissions from new 1981 model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed (1):

1981 EXHAUST EMISSIONS STANDARDS
(grams per mile)

Vehicle Type(2)	Equivalent Inertia Weight (lbs.) (3)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(4)	Carbon Monoxide	Oxides of Nitrogen (5)
PC	All	50,000	(0.41)	3.4	1.0
PC(6)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (7)	3.4	1.5
PC (Option 2)	All	100,000	0.46 (7)	4.0	1.5
LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39 (0.41) (7)	9.0	1.5
LDT,MDV (Option 2)	0-3999	100,000	0.46 (7)	10.6	1.5
LDT,MDV	4000-5999	50,000	0.50 (0.50)	9.0	1.5
LDT,MDV (Option 1)	4000-5999	100,000	0.50 (0.50) (7)	9.0	2.0
MDV	6000 & larger	50,000	0.60 (0.60)	9.0	2.0
MDV (Option 1)	6000 & larger	100,000	0.60 (0.60) (7)	9.0	2.3

(1) Subsection (a) shall remain in effect until December 31, 1991, and as of that date is repealed unless a later regulation deletes or extends that date. Notwithstanding the repeal or expiration of this procedure on December 31, 1991, the provisions of the regulation as they existed prior to such repeal or expiration shall continue to be operative and effective for those events occurring prior to the repeal or expiration.

(2) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(3) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(4) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(5) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(6) The second set of 50,000 mile passenger car standards is optional. A manufacturer must select either the primary or optional sets of 50,000 mile standards for its full product line for both 1981 and 1982 model years.

(7) For vehicles from evaporative emission families with projected 50,000 mile evaporative emissions values below 1.0 g/test, an adjustment to the hydrocarbon exhaust emission standards may be granted by the Executive Officer. The adjusted standard will be calculated using the following formula:

$$HC_{ex} = .75\ [.185 - (Di + 3.3\ Hs) : 29.4] + HC_o$$

Where:

HC_{ex} = adjusted exhaust hydrocarbon standard

HC_o = unadjusted exhaust hydrocarbon standard

Di = diurnal evaporative emissions

Hs = hot soak evaporative emissions

(b) The exhaust emissions from new 1982 model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed (1):

1982 EXHAUST EMISSIONS STANDARDS
(grams per mile)

Vehicle Type(2)	Equivalent Inertia Weight (lbs.) (3)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(4)	Carbon Monoxide	Oxides of Nitrogen (5)
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC(6)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (0.41)	7.0	1.5
PC (Option 2)	All	100,000	0.46	8.3	1.5
LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39 (0.41)	9.0	1.5
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.5
LDT,MDV	4000-5999	50,000	0.50 (0.50)	9.0	1.5
LDT,MDV (Option 1)	4000-5999	100,000	0.50 (0.50)	9.0	2.0
MDV	6000 & larger	50,000	0.60 (0.60)	9.0	2.0
MDV (Option 1)	6000 & larger	100,000	0.60 (0.60)	9.0	2.3

(1) Subsection (b) shall remain in effect until December 31, 1992, and as of that date is repealed unless a later regulation deletes or extends that date. Notwithstanding the repeal or expiration of this procedure on December 31, 1992, the provisions of the regulation as they existed prior to such repeal or expiration shall continue to be operative and effective for those events occurring prior to the repeal or expiration.

(2) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(3) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(4) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(5) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(6) The second set of 50,000 mile passenger car standards is optional. A manufacturer must select either the primary or optional sets of 50,000 mile standards for its full product line for both 1981 and 1982 model years.

(c) The exhaust emissions from new 1983 model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed (1):

1983 EXHAUST EMISSIONS STANDARDS(7)
(grams per mile)

Vehicle Type(2)	Equivalent Inertia Weight (lbs.) (3)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(4)	Carbon Monoxide	Oxides of Nitrogen (5)
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC(6)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (0.41)	7.0	1.5
PC (Option 2)	All	100,000	0.46	8.3	1.5
LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV (6)	0-3999	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39 (0.41)	9.0	1.5
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.5
LDT,MDV	4000-5999	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV	4000-5999	100,000	0.50 (0.50)	9.0	2.0
MDV	6000 & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60 (0.60)	9.0	2.0

(1) Subsection (c) shall remain in effect until December 31, 1993, and as of that date, is repealed unless a later regulation deletes or extends that date. Notwithstanding the repeal or expiration of this regulation on December 31, 1993, the provisions of the regulation as they existed prior to such repeal or expiration shall continue to be operative and effective for those events occurring prior to the repeal or expiration.

(2) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(3) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(4) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(5) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR FPart 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(6) This set of standards for 1983 and later model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1960.15.

(7) For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

(d) The exhaust emissions from new 1984 through 1987 ~~and subsequent~~ model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed:

1984 ~~AND SUBSEQUENT~~ THROUGH 1987 EXHAUST EMISSIONS STANDARDS(6)(7)

(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.) (2)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC(5)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV (5)	0-3999	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)	4000-5999	100,000	0.50 (0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(5) This set of standards for 1984 and later model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1960.15.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, and 0.2 g/mi for the 1986 ~~through 1988~~ and 1987 model years~~, and 0.08 g/mi for the 1989 and subsequent model years~~. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(7) For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

(e) The exhaust emissions from new 1981 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles certified to special standards authorized by Sections 1960.2, 1960.3, and 1960.4, Subchapter 1, Chapter 3, Title 13, California Administrative Code, subject to registration and sold and registered in this state, shall not exceed (1):

SPECIAL EXHAUST EMISSIONS STANDARDS(10)
(grams per mile)

Year	Vehicle Type(2)	Equivalent Inertia Weight (lbs.) (3)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(4)	Carbon Monoxide	Oxides of Nitrogen (5)
1981	PC(6)	All	50,000	0.39 (0.41)	7.0	1.5
	LDT,MDV(7)	0-3999	50,000	0.39 (0.41)	9.0	1.5
1982(8)	PC	All	50,000	0.39 (0.41)	7.0	1.0
1983(8)(11)	PC	All	50,000	0.39 (0.41)	7.0	0.7 (9)
	LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	1.0
1984(8)(11)	PC	All	50,000	0.39 (0.41)	7.0	0.7
	LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	0.7 (9)
1985(8)(11)	LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	0.7

(1) Subsection (e) shall remain in effect until December 31, 1990, and as of that date is repealed unless a later regulation deletes or extends that date. Notwithstanding the repeal or expiration of this procedure on December 31, 1990, the provisions of the regulation as they existed prior to such repeal or expiration shall continue to be operative and effective for those events occurring prior to the repeal or expiration.

(2) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(3) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(4) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(5) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subparagraph B) shall be no greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded to the nearest 0.1 gm/mi before being compared.

(6) For vehicles certified to special standards authorized by Section 1960.2, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code.

(7) For vehicles certified to special standards authorized by Section 1960.3, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code.

(8) For vehicles certified to special standards authorized by Section 1960.4, Article 2, Subchapter 1, Chapter 3, Title 13, California Administrative Code. Special standards revert to "1983 and subsequent" standards for 1985 and subsequent passenger cars and 1986 and subsequent LDTs and MDVs.

(9) The Executive Officer may grant limited relief from the 1983 passenger car and 1984 LDT and MDV special NOx standard to a manufacturer who exceeds the standard because of unforeseen technical problems.

(10) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, 0.2 g/mi for the 1986 through 1988 model years, and 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(11) For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

5. Additional Requirement

a. A statement must be supplied that the production vehicles shall be in all material respects the same as those for which certification is granted.

b. For model years 1981 through 1984, *If* if a gasoline-fueled vehicle manufacturer requires the use of unleaded fuel, a statement will be required that the engine and transmission combinations for which certification is requested are designed to operate satisfactorily on a gasoline having a research octane number not greater than 91. This requirement shall not apply to gaseous-fueled vehicles.

c. Labeling required pursuant to paragraph 86.079-35 and Section 1965, Chapter 3, Title 13 of the California Administrative Code shall conform with the requirements specified in the "California Motor Vehicle Tune-Up Label Specifications".

d. For gasoline-powered vehicles, evidence shall be supplied that the air/fuel metering system or secondary air injection system is capable of providing sufficient oxygen to theoretically allow enough oxidation to attain the CO emissions standard at barometric pressures equivalent to those expected at altitudes ranging from sea level to 6000 feet elevation.

e. The mechanism for adjusting the idle air/fuel mixture, if any, shall be designed so that either:

(i) The mixture adjustment mechanism is not visible, even with the air cleaner removed, and special tools and/or procedures are required to make adjustments; or

(ii) In the alternative, the Executive Officer may, upon reasonable notice to the manufacturer, require that a certification test of a vehicle be conducted with the idle air/fuel mixture at any setting which the Executive Officer finds corresponds to settings likely to be encountered in actual use. The Executive Officer, in making this finding, shall consider the difficulty of making adjustments, damage to the carburetor in the event of any effort to make an improper adjustment, and the need to replace parts following the adjustment.

The manufacturer shall submit for approval by the Executive Officer his or her proposed method for compliance with this requirement in his or her preliminary application for certification.

f. The exhaust emissions shall be measured from all exhaust emission data vehicles tested in accordance with the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B). The oxides of nitrogen emissions measured during such tests shall be multiplied by the oxides of nitrogen deterioration factor computed in accordance with paragraph 86.078-28, and then rounded and compared with the standard as set forth in paragraph 4 preceding. All data obtained pursuant to this paragraph shall be reported in accordance with procedures applicable to other exhaust emissions data required pursuant to these procedures.

In the event that one or more of the manufacturer's emission data vehicles fail the HWFET standard listed in paragraph 4, the manufacturer may submit to the Executive Officer engineering data or other evidence showing that the system is capable of complying with the standard. If the Executive Officer finds, on the basis of an engineering evaluation, that the system can comply with the HWFET standard, he or she may accept the information supplied by the manufacturer in lieu of vehicle test data.

g. The manufacturer shall submit to the Executive Officer a statement that those vehicles for which certification is requested have driveability and performance characteristics which satisfy that manufacturer's customary driveability and performance requirements for vehicles sold in the United States. This statement shall be based on driveability data and other evidence showing compliance with the manufacturer's performance criteria. This statement shall be supplied with the manufacturer's final application for certification, and with all running changes for which emission testing is required.

If the Executive Officer has evidence to show that in-use vehicles demonstrate poor performance that could result in wide-spread tampering with the emission control systems, he or she may request all driveability data and other evidence used by the manufacturer to justify the performance statement.

h. Certification, if granted, is effective only for the vehicle/engine family described in the original manufacturer's certification application. Modifications by a secondary manufacturer to vehicles/engines shall be deemed not to increase emissions above the standards under which those vehicles/engines were certified and to be within the original certification if such modifications do not: (1) increase vehicle weight more than 10 percent above the curb weight, increase frontal area more than 10 percent, or result in a combination increase of weight plus frontal area of more than 14 percent; or (2) include changes in axle ratio, tire size, or tire type resulting in changes in the drive train ratio of more than 5 percent; or (3) include any modification to the emission control system. No originally certified vehicle/engine which is modified by a secondary manufacturer in a manner described in items (1) through (3) of the preceding sentence may be sold to an ultimate purchaser, offered or delivered for sale to an ultimate purchaser, or registered in California unless the modified vehicle/engine is certified by the state board in accordance with applicable test procedures to meet emission standards for the model year for which the vehicle/engine was originally certified.

For the purposes of this subsection, "secondary manufacturer" means any person, other than the original manufacturer, who modifies a new motor vehicle prior to sale to the ultimate purchaser.

~~i. For all vehicles subject to the provisions of Section 1968, Title 13, California Administrative Code, the manufacturer shall submit with its application for certification a description of the malfunction and diagnostic system to be installed on the vehicles. The vehicles shall not be certified unless the Executive Officer finds that the malfunction and diagnostic system complies with the requirements of Section 1968, Title 13, California Administrative Code.~~

6. Optional 100,000 Mile Certification Procedure

The alternate emission standards shown in paragraph (4) preceding shall apply to any engine family which meets all of the following additional requirements:

a. Each exhaust emission durability data vehicle shall be driven, with all emission control systems installed and operating, for 100,000 miles or such lesser distance as the Executive Officer may agree to as meeting the objectives of this procedure. Emission tests performed on emission-data vehicles and durability-data vehicles (for determination of the deterioration factors) shall be non-regeneration emission tests for diesel-powered passenger cars, light-duty trucks and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems. Compliance with the emission standards shall be established as follows:

(i) The linear regression line for all pollutants shall be established by use of all required data from tests of the durability vehicle at every 5000 mile interval from 5000 to 100,000 miles. The requirements in subparagraph 86.078-28(a)(4)(i)(B) (durability vehicles must meet emissions standards) refer, for each pollutant, to the highest of either the federal 50,000 miles or California 100,000 mile emission standards.

(ii) Compliance with the hydrocarbon and carbon monoxide standards shall be determined as follows:

(a) For Option 1:

(A) the interpolated 4000 and 50,000 mile points on the linear regression line in (i) shall not exceed the appropriate hydrocarbon and carbon monoxide standards, except as in (B) below.

(B) the linear regression line in (i) may exceed the standard provided that no data point exceeds the standard.

(C) The hydrocarbon and carbon monoxide data from the 4000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 50,000 mile point by the interpolated 4000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate hydrocarbon and carbon monoxide standards.

(b) For Option 2:

(A) The interpolated 4000 and 100,000 mile points on the linear regression line in (i) shall not exceed the appropriate hydrocarbon and carbon monoxide standards, except as in (B) below.

(B) The linear regression line in (i) may exceed the standard provided that no data point exceeds the standard.

(C) The hydrocarbon and carbon monoxide data from the 4000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 100,000 mile point by the interpolated 4000 mile point, and the appropriate exhaust emission correction factor

(diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate 100,000 mile hydrocarbon and carbon monoxide standards.

(iii) Compliance with the oxides of nitrogen standard for Options 1 and 2 shall be determined as follows:

(a) the interpolated 4000 and 100,000 mile points on the linear regression line in (i) shall not exceed the appropriate 100,000 mile oxides of nitrogen standard, except as in (b) below.

(b) the linear regression line in (i) may exceed the standard provided that no data point exceeds the standard.

(c) the oxides of nitrogen data from the 4000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 100,000 mile point by the interpolated 4000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate 100,000 mile oxides of nitrogen standard.

(iv) Compliance with the particulate standard for options 1 and 2 shall be determined as follows:

(a) the interpolated 4000 and 50,000 mile points on the linear regression line in (i) shall not exceed the appropriate particulate standard, except as in (b) below.

(b) the linear regression line in (i) may exceed the standard provided that no data point exceeds the standard.

(c) the particulate data from the 4000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 50,000 mile point by the interpolated 4000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate particulate standard.

All references in these test procedures to "useful life", 5 years, and 50,000 miles shall mean "total life", 10 years, and 100,000 miles, respectively, except in subparagraph (ii).

b. Only the following scheduled maintenance shall be allowed under subparagraph 86.078-25(a)(1)(i).

25(a)(1)(i)(A) Option 1. For 1981 ~~and later~~ through 1987 model gasoline or diesel-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated.

(1) Drive belt tension on engine accessories (30,000 miles).
(2) Valve lash (15,000 miles).
(3) Spark plugs (30,000 miles).
(4) Air filter (30,000 miles).
(5) Exhaust gas sensor (30,000 miles): Provided that~~,for 1987 and prior model years,~~ an audible and/or visible signal approved by the Executive Officer alerts the vehicle operator to the need for sensor maintenance. ~~at the mileage point; and provided that for 1988 and subsequent model year vehicles;~~

~~(a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is again reached and shall again remain activated until reset. When the maintenance indicator consists of a light, it shall also activate automatically in the engine run key position before engine cranking to indicate that it is functioning. The maintenance indicator shall be located on the instrument panel and shall, when activated, display the words "oxygen sensor" or may display such other words determined by the Executive Officer to be likely to cause the vehicle owner to seek oxygen sensor replacement. The maintenance indicator shall be separate from the malfunction indicator light required by Section 1968, Title 13, California Administrative Code;~~

~~(b) the manufacturer shall provide free replacement of the oxygen sensor, including both parts and labor, and shall reset the maintenance indicator without any charge, the first time the maintenance interval established during certification testing is reached for vehicles certified with scheduled sensor maintenance before 50,000 miles. If the oxygen sensor is replaced pursuant to the warranty provisions of Section 2037, Title 13, California Administrative Code, before the~~

~~first-maintenance-interval-is-reached,-the-manufacturer-shall also-replace-the-oxygen-sensor-and-reset-the-maintenance indicator-at-the-mileage-point-determined-by-adding-the maintenance-interval-to-the-vehicle's-mileage-at-the-time-of the-warranty-replacement.--If-the-calculated-mileage-point-for a-second-oxygen-sensor-replacement-would-exceed-50,000-miles, no-free-second-replacement-shall-be-required;~~

~~(c)--The-maintenance-indicator-shall-be-resettable.--The maintenance-instructions-required-by-paragraph-3.f.-of-these procedures-shall-provide-instructions-for-the-resetting-of-the maintenance-indicator,-and-shall-specify-that-the-maintenance indicator-shall-be-reset-each-time-the-oxygen-sensor-is replaced;-and~~

~~(d)-Notwithstanding-the-provisions-of-Section-2037(c),-Title 13,-California-Administrative-Code,-the-oxygen-sensor, including-any-replacement-required-pursuant-to-this-section, shall-be-warranted-for-the-useful-life-of-the-vehicle-or engine.--If-such-oxygen-sensor-fails-during-the-useful-life period,-it-shall-be-replaced-by-the-manufacturer-in-accordance with-Section-2037(d),-Title-13,-California-Administrative-Code.~~

(6) Choke, cleaning or lubrication only (30,000 miles).
(7) Idle speed (30,000 miles).
(8) Fuel Filter (30,000 miles).
(9) Injection timing (30,000 miles).

25(a)(1)(i)(B) Option 2. For 1981 ~~and later~~ <u>through 1987</u> model gasoline or diesel-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated:

(1) Drive belt tension on engine accessories (30,000 miles).
(2) Valve lash (15,000 miles).
(3) Spark plugs (30,000 miles).
(4) Air filter (30,000 miles).
(5) Fuel filter (30,000 miles).
(6) Idle speed (30,000 miles).
(7) Injection timing (30,000 miles).

c. In addition, adjustment of the engine idle speed (curb idle and fast idle), valve lash, and engine bolt torque may be performed once during the first 5000 miles of scheduled driving, provided the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

d. The manufacturer agrees to apply to vehicles certified under this paragraph the provision of Section 43204 of the California Health and Safety Code for a period of ten years or 100,000 miles, whichever first occurs.

APPENDIX

Calculation procedures based on the Federal CVS-1975 Test Procedure. The reported test results shall be computed by use of the following formulas:

CO_{conc} = Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO_2 extraction, in ppm.

CO_{dm} = Carbon monoxide concentration of the dilution air sample as measured, in ppm.

CO_d = Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in ppm.

CO_e = Carbon monoxide concentrations of the dilute exhaust sample volume corrected for water vapor and carbon dioxide extraction, in ppm. The calculation assumes the carbon to hydrogen ratio of the fuel to be 1:3.802 for natural gas and 1:2.658 for LPG.

CO_{em} = Carbon monoxide concentration of the dilute exhaust sample as measured, in ppm.

CO_{mass} = Carbon monoxide emissions, in grams per test phase.

$CO_{2_{conc}}$ = Carbon dioxide concentration of the dilute exhaust sample corrected for background and water vapor, in percent.

CO_{2_e} = Carbon dioxide concentration of the dilute exhaust sample, in percent.

$CO_{2_{mass}}$ = Carbon dioxide emissions, in grams per test phase.

$Density_{CO}$ = Density of carbon monoxide is 32.97 g/ft^3 at 68°F and 760 mm. Hg pressure.

Density CO_2 = Density of Carbon Dioxide is 51.85 g/ft^3 68°F and 760 mm. Hg pressure.

$Density_{HC}$ = Density of hydrocarbons is 18.64 g/ft^3 for natural gas and 17.28 g/ft^3 for LPG assuming an average carbon to hydrogen ratio of 1:3.802 for natural gas and 1:2.658 for LPG, at 68°F and 760 mm Hg pressure.

$Density_{NO_2}$ = Density of oxides of nitrogen is 54.16 g/ft^3 assuming they are in the form of nitrogen dioxide, at 68°F and 760 mm Hg pressure.

DF = Dilution Factor

H = Absolute humidity in grains of water per pound of dry air.

HC_{conc} = Hydrocarbon concentration for the dilute exhaust sample corrected for background, in ppm carbon equivalent, i.e., equivalent propane X 3.

HC_d = Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent.

HC_e = Hydrocarbon concentration of the dilute exhaust sample, in ppm carbon equivalent.

HC_{mass} = Hydrocarbon emissions, in grams per test phase.

K_H = Humidity correction factor

N = Number of revolutions of the positive displacement pump during the test phase while samples are being collected.

NOx_{conc} = Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in ppm.

NO_d = Oxides of nitrogen concentration of the dilute air as measured, in ppm.

NOx_e = Oxides of nitrogen concentration of the dilute exhaust sample as measured, in ppm.

NOx_{mass} = Oxides of nitrogen emissions, in grams per test phase.

P_B = Barometric pressure, in mm. Hg.

P_d = Saturated vapor pressure, in mm. Hg at ambient dry bulb temp.

P_i = Pressure depression below atmospheric measured at the inlet to the positive displacement pump.

T_p = Average temperature of dilute exhaust entering positive displacement pump during test while samples are being collected, in degrees Rankine.

R_a = Relative humidity of the ambient air, in percent.

V_{mix} = Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions ($528^{o}R$ and 760 mm. Hg)

Vo = Volume of gas pumped by the positive displacement pump, in cubic feet per revolution. This volume is dependent on the pressure differential across the positive displacement pump.

Y_{ct} = Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.

Y_{ht} = Mass emissions as calculated from the "transient" phase of the hot start test, in grams per test phase.

Y_s = Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams test phase.

Y_{wm} = Weighted mass emissions of each pollutant, i.e., HC, CO, or NOx, in grams per vehicle mile.

For passenger cars, light duty trucks, and medium duty vehicles:

(a) The mass emissions of each pollutant in grams per mile is

$$Y_{wm} = (0.43Y_{ct} + 0.57\ Y_{ht} + Y_s)/7.5$$

(b) The mass of each pollutant for each phase of both the cold start test and the hot start test is determined from the following:

(1) Hydrocarbon mass:

$$HC_{mass} = V_{mix} \times Density_{HC} \times (HC_{conc}/1{,}000{,}000)$$

(2) Oxides of nitrogen mass:

$$NOx_{mass} = V_{mix} \times Density_{NO_2} \times K_H \times (NOx_{conc}/1{,}000{,}000)$$

K_H = humidity correction factor

(3) Carbon monoxide mass:

$$CO_{mass} = V_{mix} \times Density_{CO} \times (CO_{conc}/1{,}000{,}000)$$

(4) Carbon dioxide mass:

$$CO_{2\,mass} = V_{mix} \times Density_{CO_2} \times (CO_{2\,conc}/100)$$

$$V_{mix} = \frac{V_o \times N \times (P_b - P_i) \times 528}{(760)\,(T_p)}$$

$$HC_{conc} = HC_e - HC_d\,(1-1/DF)$$

$$NOx_{conc} = NOx_e - NOx_d\,(1-1/DF)$$

$$CO_{conc} = CO_e - CO_d\,(1-1/DF)$$

$$CO_e = (1-0.02901\ CO_{2\,e} - 0.000323\ R_a)\ CO_{em} \text{ for natural gas}$$

$$CO_e = (1-0.02328\ CO_{2\,e} - 0.000323\ R_a)\ CO_{em} \text{ for LPG}$$

$$CO_d = (1-0.000323\ R_a)\ CO_{dm}$$

$$KH = \frac{1}{1-0.0047(H-75)}$$

$$H = \frac{(43.478R_a)\,(Pd)}{P_B - \frac{P_d \times R_a}{100}}$$

$$DF = \frac{9.77}{CO_{2\,e} + (HC_e + CO_e) \times 10^{-4}} \quad \text{for natural gas}$$

$$DF = \frac{11.7}{CO_{2\,e} + (HC_e + CO_e) \times 10^{-4}} \quad \text{for LPG}$$

Fuel Economy Calculations for Gaseous Fuels
Based on the Cold Start CVS-1975
Federal Test Procedure

Assume the fuel meets HD-5 specifications (95% C_3H_8, 5% nC_4H_{10}, by volume)

1. Physical constants of Propane and Normal Butane

Component	Mol. Wt.	Sp. Gr.	Liquid Density lb/gal @ 60°F	Liquid Density of HD-5 lb/gal at 60°F
C_3H_8	44.094	0.508	4.235 x (0.95) =	4.0233
nC_4H_{10}	58.12	0.584	4.868 x (0.05) =	.2434
				4.2667

2. Density of the HD-5 fuel

(0.95 X 4.235) + (0.05 X 4.868) = 4.267 lb/gal @ 60°F

3. Molecular Weights

Specie	Mol. Wt.
C	12.01115
H	1.00797
O	15.9994
CO	28.01055
CO_2	44.00995
*$CH_{2.658}$	14.6903

*Average ratio of Hydrogen to carbon atoms in HD-5 fuel.

C_3H_8 $\frac{8}{3}$ = 2.666 x 0.95 (% propane) = 2.533

nC_4H_{10} $\frac{10}{4}$ = 2.5 x 0.05 (% Butane) = $\frac{.125}{2.658}$

4. Weight of Carbon in:

CO = wt. of CO x (12.01115/28.01055) = wt CO x (0.429)

CO_2 = wt of CO_2 x (12.01115/44.00995) = wt CO_2 x (0.273)

$CH_{2.658}$ = wt. of $CH_{2.658}$ x (12.01115/14.6903) = wt $CH_{2.658}$ x (0.818)

5. Wt. of Carbon per gallon of LPG

wt. of carbon = 4.2667 lbs/gal x 453.59 gms/lb x 0.818 = 1583 grams C/gal HD-5

6. Fuel economy:

$$\frac{\text{grams C/gal}}{\text{grams C in exhaust/mi}} = \text{miles/gal.}$$

$$\text{LPG} = \frac{1583 \text{ gms C/gal}}{(0.818(HC) + (0.429)(CO) + (0.273)\ (CO_2)}$$

HC = CVS HC in grams/mile
CO = CVS CO in grams/mile
CO_2 = CVS CO_2 in grams/mile

$$\text{For gasoline} = \frac{2423}{(0.866)\ HC + (0.429)\ CO + (0.273)\ CO_2}$$

$$\text{For Natural Gas} = \frac{1535}{(0.759)\ HC + (0.429)\ CO + (0.273)\ CO_2}$$

ATTACHMENT D

Proposed

State of California
AIR RESOURCES BOARD

CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES FOR 1988 AND SUBSEQUENT MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES

Adopted: _____

NOTE: This is a new document proposed for adoption. However, many of the provisions in the document are based on the "California Exhaust Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," as last amended October 2, 1985. The document also incorporates by reference various sections of the Code of Federal Regulations, some with modifications.

To enhance public understanding, the document is printed in a style that generally indicates changes from the previous California 1981 and subsequent model year test procedures, or terms which vary from the federal provisions. In most instances, changes from the previous California test procedures are shown by underline to indicate added language and strikeout to indicate deleted language. Only significant changes from the previous California test procedures are shown -- organizational, numbering, and editorial changes are not specifically designated. The table of contents is new, but it is not underlined.

In numerous instances, this document states that incorporated provisions of the Code of Federal Regulations are to be varied in some way. Where the directions introducing the variation (e.g., "amend paragraph 86.085-1 to read ...") are not entirely underlined, the variation is displayed in an underline and strikeout form showing changes from the reference to the federal regulation in the previous California test procedure. Where the directions introducing the variation are entirely underlined, the variation is displayed in an underline and strikeout form showing changes to the most recent incorporated federal language.

The numbering convention employed in this document, in order or priority, is: 1.a.1.i.A. Any references within specific sections in the Code of Federal Regulations are denoted in order of priority as: (a)(1)(i)(A) - the same numbering system employed in the Code of Federal Regulations.

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CALIFORNIA EXHAUST EMISSION
STANDARDS AND TEST PROCEDURES
FOR 1988 AND SUBSEQUENT
MODEL PASSENGER CARS, LIGHT-DUTY TRUCKS
AND MEDIUM-DUTY VEHICLES

The provisions of Subparts A and B, Part 86, Title 40, Code of Federal Regulations, ~~as they existed on April 15, 1978,~~ as set forth in Appendix I, to the extent they pertain to Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles, are hereby adopted as the California Exhaust Emission Standards and Test Procedures for ~~1981~~ 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, with the following exceptions and additions. ~~The test procedures applicable to the particulate exhaust emission standards for diesel-powered vehicles are contained in 40 CFR Part 86, Subpart B, as they existed on October 13, 1981.~~

1. Applicability

   a. These test procedures are applicable to 1988 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, except motorcycles. References to "light-duty trucks" in 40 CFR 86 shall apply both to "light-duty trucks" and "medium-duty vehicles" in these procedures.

   b. Any reference to vehicle sales throughout the United States shall mean vehicle sales in California.

   c. Regulations concerning EPA hearings, EPA inspections, specific language on the Certificate of Conformity, evaporative emissions, high-altitude vehicles and testing, particulate and oxides of nitrogen averaging and engine family standards applicable in such averaging, alternative useful life, selective enforcement audit, and heavy-duty engines and vehicles shall not be applicable to these procedures, except where specifically noted.

   d. Any reference to gasoline-powered vehicles shall also apply to vehicles powered by gaseous fuels.

2. Definitions

   a. "Administrator" means the Executive Officer of the Air Resources Board (ARB).

   b. "Certificate of Conformity" means Executive Order certifying vehicles for sale in California.

   c. "Certification" means certification as defined in Section 39018 of the Health and Safety Code.

   d. "Passenger car" means any motor vehicle designed primarily for transportation of persons and having a design capacity of 12 persons or less.

e. "Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.

f. "Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6000 pounds, except passenger cars.

g. "Light-duty truck" means any motor vehicle, rated at 6000 pounds gross vehicle weight or less, which is designed primarily for purposes of transportation of property or is a derivative of such a vehicle, or is available with special features enabling off-street or off-highway operation and use.

h. "Medium-duty vehicle" means any heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 8500 pounds or less.

i. "Gaseous fuels" means liquefied petroleum gas, compressed natural gas, or liquefied natural gas fuels for use in motor vehicles.

j. "Trap oxidizer system" means an emission control system which consists of a trap to collect particulate matter and a mechanism to oxidize the accumulated particulate.

k. "Regeneration" means the process of oxidizing accumulated particulate matter. It may occur continually or periodically.

l. "Periodically regenerating trap oxidizer system" means a trap oxidizer system that utilizes, during normal driving conditions for cleaning the trap, an automated regeneration mode which can be easily detected.

m. "Continually regenerating trap oxidizer system" means a trap oxidizer system that does not utilize an automated regeneration mode during normal driving conditions for cleaning the trap.

n. "Non-regeneration emission test" means a complete emission test which does not include a regeneration.

o. "Regeneration emission test" means a complete emission test which includes a regeneration.

p. "Regeneration interval" means the interval from the start of a regeneration to the start of the next regeneration.

q. "Useful Life" means a period of use of either: 5 years or 50,000 miles, whichever first occurs, or if denoted by the emission standards to which a given vehicle is certifying, 10 years or 100,000 miles, whichever first occurs.

3. Standards

The following standards represent the maximum projected exhaust emissions for the useful life of the vehicle.

a. The exhaust emissions from new ~~1984~~ 1988 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, subject to registration and sold and registered in this state, shall not exceed:

~~1984~~ 1988 AND SUBSEQUENT MODEL YEAR EXHAUST EMISSIONS STANDARDS(5)(6)~~(7)~~
(grams per mile)

Vehicle Type(1)	~~Equivalent Inertia Weight (2)~~	Loaded Vehicle Weight (lbs.)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons~~(3)~~(2)	Carbon Monoxide	Oxides of Nitrogen ~~(4)~~(3)
PC		All	50,000	0.39 (0.41)	7.0	0.4
PC~~(5)~~(4)		All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)		All	100,000	0.39 (0.41)	7.0	1.0
PC (Option 2)		All	100,000	0.46	8.3	1.0
LDT,MDV		0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV ~~(5)~~(4)		0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)		0-~~3999~~ 3750	100,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 2)		0-~~3999~~ 3750	100,000	0.46	10.6	1.0
LDT,MDV		~~4000-5999~~ 3751-5750	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)		~~4000-5999~~ 3751-5750	100,000	0.50 (0.50)	9.0	1.5
MDV	5751	~~6000~~ & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	5751	~~6000~~ & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

~~(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).~~

~~(3)~~(2) Hydrocarbon standards in parentheses apply to total hydrocarbons. In order to demonstrate compliance with a non-methane hydrocarbon emission standard, hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures".

~~(4)~~(3) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

~~(5)~~(4) This set of standards ~~for 1984 and later model vehicles~~ is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section ~~1960.1~~ 1960.1.5 of Title 13, California Administrative Code.

~~(6)~~(5) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: ~~0.4 g/mi for the 1985 model year,~~ 0.2 g/mi for the ~~1986 through~~ 1988 model years, and 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

~~(7)~~(6) For gaseous-fueled vehicles the calculation procedures provided in ~~the~~ Appendix V shall be used for determining emissions and fuel economy.

4. Initial Requirements

a. Application for Certification

In paragraph ~~86.079-21~~ 86.088-21:

1. Amend subparagraph (b)(1)(i) to read:

(i) Identification and description of the vehicles (or engines) covered by the application and a description (including a list and part numbers of all major emission control system parts and fuel system components) of their engine (vehicles only), emission control system and fuel system components, including if applicable, the turbocharger and intercooler. This shall include a detailed description of each auxiliary emission control device (AECD) to be installed in or on any certification test vehicle (or certification test engine).

2. Amend subparagraph (b)(2) to read:

(2) Projected California ~~U.S.~~ sales data sufficient to enable the ~~Administrator~~ Executive Officer to select a test fleet representative of the vehicles (or engines) for which certification is requested. ~~The sales data shall also include the altitude of intended sale for light duty trucks.~~

3. Amend subparagraph (b)~~(5)~~(4)(iii)(C)(1) and (C)(2) to read:

(1) A statement of maintenance and procedures consistent with the restrictions imposed under subparagraph ~~86.078-25(a)(1)~~ 86.085-25(a)(1), necessary to assure that the vehicles (or engines) covered by a certificate of conformity in operation in normal use conform to the regulations, and a description of the program for training of personnel for such maintenance, and the equipment required.

(2) A statement that the vehicles sold comply with the California high-altitude emission requirements as specified in Section II.b. (High Altitude Requirements) in these procedures.

b. Test Vehicles and Test Engines; Assigned Deterioration Factors (DFs)

In paragraph 86.085-24:

1. Delete subparagraph (b) (Emission-data vehicle selection provisions)

REPLACE WITH:

(b) Emission-data vehicles shall be selected according to the provisions of Appendix II. Selection shall be based on highest sales volume and will require only two emission-data vehicles for certification testing per engine family. (For fifty-state families the reference in the federal procedures to configuration or sales shall mean California configurations and sales rather than total family configurations and sales.)

The Executive Officer will accept data from vehicles tested for EPA certification provided that they are the same configuration selected according to California's procedures. Also, Federal vehicles may be reconfigured to California versions and tested to show compliance with California emission standards. The Executive Officer will also allow the manufacturer to reconfigure California vehicles.

2. Delete subparagraph (e)(1) (Reduced number of test vehicles)

REPLACE WITH:

(1) Any manufacturer whose projected California annual sales for the model year in which certification is sought is less than a combined total of 3,000 passenger cars, light-duty trucks, medium-duty vehicles may request a reduction in the number of test vehicles determined in accordance with the foregoing provisions of this paragraph. The Executive Officer may agree to such lesser numbers as he or she determines would meet the objectives of this procedure.

3. Delete subparagraph (e)(2) (Assigned deterioration factors)

REPLACE WITH:

(2)(i) Any manufacturer may request to certify engine families using assigned DF's for a combined total of 3,000 projected annual California sales of passenger cars, light-duty trucks, medium-duty vehicles per manufacturer regardless of total sales.

(2)(ii) Assigned DF's shall be used only where specific mileage accumulation data do not exist (i.e., if a vehicle manufacturer uses an engine/system combination where DF's derived from exhaust emission testing exist, then the assigned factors cannot be used).

Assigned DF's shall be used in lieu of data from durability vehicle(s) only when a manufacturer demonstrates that it has control over design specifications, can provide development

data, has in-house testing capabilities including accelerated aging of components/systems, and has evaluation criteria to ensure emission control system (ECS) durability for the vehicle's useful life. The applying manufacturer must demonstrate engine durability and that the emission control system(s) developed or adapted for the particular engine will be durable and comply with the applicable emission standards for the engine's or vehicle's useful life. In evaluating any information provided, all relevant test data and design factors shall be considered, including but not limited to: vehicle application, engine design, catalyst loading and volume, space velocity in the catalyst, engine exhaust gas concentrations and catalyst temperatures for various operating modes, and the durability of any emission control system components which may have been used in other vehicle applications. The assigned DF's shall be applied only to entire families.

If emission control parts from other certified vehicles are utilized, then parameter comparisons of the above data must also be provided including part numbers where applicable. Emission control durability may include special in-house specifications.

(2)(iii) The criteria for evaluating assigned DF's for evaporative families are the same as those for exhaust families. However, in determining evaporative family DF's the "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Liquefied Petroleum Gas- or Gasoline-Powered Motor Vehicles" require that an evaporative family DF be determined by averaging DF's obtained from durability vehicle testing and from bench testing. Therefore, if a manufacturer meets the criteria as specified above in (e)(2)(i) and (e)(2)(ii), the Executive Officer may grant assigned DF's for either (or both) the durability vehicle DF or the bench DF.

Assigned DF's for bench test requirements do not depend upon the 3,000 maximum sales limit. The assigned bench DF is applicable only to evaporative emission control systems which are similar to those used by the manufacturer for 1980 or later model-year vehicles and where an evaporative vehicle DF was determined. In evaluating a request for an assigned bench DF, all relevant information shall be considered, including but not limited to: fuel tank capacity, fuel tank temperatures, carburetor bowl "capacity", underhood temperatures, canister capacity and location, and any other comparisons to the certified application.

4. Amend subparagraph ~~86.078-23(f)~~ 86.085-24(f) and (h)(1)(v) by adding the following additional requirement which reads:

The durability or emission data submitted may be from vehicles previously certified by EPA or ARB.

5. Maintenance Requirements

a. Maintenance*

Delete paragraph 86.088-25.

Delete paragraph 86.087-25.

In paragraph ~~86.078-25~~ 86.085-25:

1. Amend the title and first sentence of subparagraph (a) to read:

(a) Light-duty vehicles. Paragraph (a) of this section applies to passenger cars, light-duty trucks, and medium-duty vehicles.

~~1~~2. Amend subparagraph (a)(1) to read:

(1) Scheduled maintenance on the engine, emission control system, and fuel system of durability vehicles shall, unless otherwise provided pursuant to paragraph (a)(5)(iii), be restricted as set forth in the following provisions. If a manufacturer must revise the maintenance schedule, prior approval by the Executive Officer is required. Unscheduled maintenance must not render a durability vehicle nonrepresentative of the production vehicles. The unscheduled maintenance must not be likely to be required in the normal use of the vehicle. Unauthorized or unjustifiable unscheduled maintenance may be cause for disqualification of a durability vehicle.

Manufacturers must submit durability maintenance logs to the Executive Officer. The maintenance logs shall include the mileage where maintenance occurred, the nature of the maintenance, and the name and part numbers of all fuel system and emission control parts involved with the maintenance.

(i)(A) For gasoline-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated:

(1) Drive belts on engine accessories (tension adjustment only); (30,000 miles).

(2) Valve lash (15,000 miles).

(3) Spark plugs (30,000 miles).

(4) Air filter (30,000 miles).

* These requirements are for vehicles certified to the 50,000 mile standard. Requirements for the vehicles certified to the optional 100,000 mile standards are found in section 10 (Optional 100,000 Mile Certification Procedure) of these procedures.

(5) Exhaust gas sensor (30,000 miles)~~:~~, Provided ~~that,-for-1987-and-prior-model-years,-an audible-and/or-visible-signal-approved-by-the Executive-Officer-alerts-the-vehicle-operator to-the-need-for-sensor-maintenance-different-at the-mileage-point;-and-provided-that,-for-1988 and-subsequent-model-year-vehicles~~:

(a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is again reached and shall again remain activated until reset. When the maintenance indicator consists of a light, it shall also activate automatically in the engine-run key position before engine cranking to indicate that it is functioning. The maintenance indicator shall be located on the instrument panel and shall, when activated, display the words "oxygen sensor" or may display such other words determined by the Executive Officer to be likely to cause the vehicle owner to seek oxygen sensor replacement. The maintenance indicator shall be separate from the malfunction indicator light required by Section 1968, Title 13, California Administrative Code;

(b) the manufacturer shall provide free replacement of the oxygen sensor, including both parts and labor, and shall reset the maintenance indicator without any charge, the first time the maintenance interval established during certification testing is reached for vehicles certified with scheduled sensor maintenance before 50,000 miles. If the oxygen sensor is replaced pursuant to the warranty provisions of Section 2037, Title 13, California Administrative Code, before the first maintenance interval is reached, the manufacturer shall also replace the oxygen sensor and reset the maintenance indicator at the mileage point determined by adding the

maintenance interval to the vehicle's mileage at the time of the warranty replacement. If the calculated mileage point for a second oxygen sensor replacement would exceed 50,000 miles, no free second replacement shall be required;

(c) The maintenance indicator shall be resettable. The maintenance instructions required by section 5.b. of these procedures shall provide instructions for the resetting of the maintenance indicator, and shall specify that the maintenance indicator shall be reset each time the oxygen sensor is replaced; and

(d) Notwithstanding the provisions of Section 2037(c), Title 13, California Administrative Code; the oxygen sensor, including any replacement required pursuant to this section, shall be warranted for the useful life of the vehicle or engine. If such oxygen sensor fails during the useful life period, it shall be replaced by the manufacturer in accordance with Section 2037(d), Title 13, California Administrative Code.

(6) Choke (cleaning or lubrication only); (30,000 miles).

(7) In addition, adjustment of the engine idle speed (curb idle and fast idle), valve lash, and engine bolt torque may be performed once during the first 5,000 miles of scheduled driving, provided the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

(i)(B) For diesel-powered vehicles, maintenance shall be restricted to the following items at intervals no more frequently than every 12,500 miles of scheduled driving, provided that no maintenance may be performed after 45,000 miles of scheduled driving:

(1) Adjust low idle speed.

(2) Adjust valve lash if required.

(3) Adjust injector timing.

(4) Adjust governor.

(5) Clean and service injector tips.

(6) Adjust drive belt tension on engine accessories.

(7) Check engine bolt torque and tighten as required.

(ii) Change of engine and transmission oil, change or service of oil filter and, for diesel-powered vehicles only, change or service of fuel filter and air filter, will be allowed at the mileage intervals specified in the manufacturer's maintenance instructions.

(iii)Maintenance shall be conducted in a manner consistent with service instructions and specifications provided by the manufacturer for use by customer service personnel.

~~2.~~ 3. Delete subparagraph (a)(3) (Service of exhaust gas recirculation system).

~~3.~~ 4. Delete subparagraph (a)(4) (Service of catalytic converter).

~~4.~~ 5. Amend subparagraph (a)(5), by adding a new subparagraph ~~(iii)~~ (iv)to read:

~~(iii)~~(iv)When a part has to be replaced while conducting unscheduled maintenance, a similarly aged part shall be used for those parts that affect emissions, unless it is impractical and unnecessary to age a part and prior approval has been obtained from the Executive Officer for use of the part without aging. In either case, an engineering report on the nature of the problem with the probable cause and corrective action shall be supplied to the Executive Officer.

6. Delete subparagraph (b) (Maintenance of light-duty trucks and heavy-duty engines)

b. Maintenance Instructions

Delete paragraph 86.087-38.

In paragraph ~~86.078-38~~ 86.085-38:

1. Amend subparagraph (a) to read:

(a) The manufacturer shall furnish or cause to be furnished to the purchaser of each new motor vehicle ~~(or motor vehicle engine)~~ subject to the standards prescribed in ~~paragraphs 86.078-8 through 86.078-11~~ Section 3 of these procedures ~~as applicable~~, written instructions for the maintenance and use of the vehicle ~~(or engine)~~ by the purchaser as may be reasonable and necessary to assure the proper functioning of emission control systems in normal use. Such instructions shall be consistent with and not require maintenance in excess of the restrictions imposed under subparagraph ~~86.078-25(a)(1)~~

86.085-25(a)(1) as amended above, except that the instructions may, subject to approval by the ~~Administrator~~ Executive Officer, require additional maintenance for vehicles operated under extreme conditions. In addition, subject to approval by the ~~Administrator~~ Executive Officer, the instructions may require inspections necessary to insure safe operation of the vehicle in use.

In addition to any maintenance which may be required pursuant to the preceding paragraph, the instructions may also recommend such inspections, maintenance, and repair as may be reasonable and necessary for the proper functioning of the vehicle and its emission control systems. If the instructions recommend maintenance in addition to that which may be required pursuant to the preceding paragraph, they shall distinguish clearly between required and recommended maintenance.

2. Amend both subparagraphs (c)(1) and (d)(1) to read:

(1) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under subparagraph ~~86.078-25(a)(1)~~ 86.085-25(a)(1). ~~If the instructions specify recommended maintenance as well as required maintenance, they shall distinguish clearly between the two.~~

~~3. Amend subparagraph (d) by adding a new subparagraph (3) to read:~~

~~(3) Such instructions shall specify the performance of all scheduled maintenance performed by the manufacturer under subparagraph 86.078-25(a)(1). If the instructions specify recommended maintenance as well as required maintenance, they shall distinguish clearly between the two.~~

c. Submission of Maintenance Instructions

Amend subparagraph ~~86.078-39(a)~~ 86.079-39(a) to read:

(a) The manufacturer shall provide to the ~~Administrator~~ Executive Officer, no later than the time of the submission required by paragraph ~~86.078-23~~ 86.088-23, a copy of the maintenance instructions which the manufacturer proposes to supply to the ultimate purchaser in accordance with subparagraph ~~86.078-38(a)~~ 86.085-38(a). The ~~Administrator~~ Executive Officer will review such instructions to determine whether they are consistent with ~~federal~~ California

requirements, and to determine whether the instructions for required maintenance are consistent with the restrictions imposed under subparagraph ~~86.078-25(a)(1)~~ 86.085-25(a)(1). The ~~Administrator~~ Executive Officer will notify the manufacturer of his or her determinations.

6. Demonstrating Compliance

a. Mileage and Service Accumulation; Emission Measurements

In paragraph ~~86.079-26~~ 86.084-26:

1 Amend (a)(3)(i) and (a)(3)(ii) by adding the following additional requirement which reads:

The Executive Officer will accept the manufacturer's determination of the mileage at which the engine-system combination is stabilized for emission data testing if (prior to testing) a manufacturer determines that the interval chosen yields emissions performance which is stable and representative of design intent. Sufficient mileage should be accumulated to reduce the possible effects of any emissions variability that is the result of insufficient vehicle operation. Of primary importance in making this determination is the behavior of the catalyst, EGR valve, trap oxidizer or any other part of the ECS which may have non-linear aging characteristics. In the alternative, the manufacturer may elect to accumulate 4,000 mile +/- 250 mile on each test vehicle within an engine family without making a determination.

2. Amend (a)(4)(i) and (a)(4)(ii) by adding the following new subparagraph (A), (B), (C), and (D) to read:

(A) For gasoline- and diesel-powered vehicles:

(1) Passenger cars, light-duty trucks and medium-duty vehicles selected by the Executive Officer or elected by the manufacturer under §86.085-24(c)(1) shall be driven, with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Executive Officer may agree to as meeting the objective of this procedure.

(2) Prior to initiation of mileage accumulation in a durability-data vehicle, manufacturers must establish the mileage test interval for durability-data vehicle testing of the engine family. Once testing has begun on a durability-data vehicle, the durability test interval for that family may not be changed. At a minimum, multiple tests must be performed at 5,000 and 50,000 miles as long as they meet the requirement of Appendix III. The Executive Officer will accept durability test interval schedules determined by the manufacturer.

The testing must provide a DF confidence level equal to or better than the confidence level using the former fixed mileage test and scheduled maintenance intervals. The procedure for making this determination is also given in Appendix III. The mileage intervals between test points must be approximately of equal length. The +/- 250 mile test point tolerance and the requirement that tests be conducted before and after scheduled maintenance is still mandatory. Emission control systems for gasoline engines which have step function changes designed into the control system must use the 5,000 mile test interval schedule.

(3) Testing before and after scheduled (or unscheduled) maintenance points must be conducted, and these data are to be included in the deterioration factor calculation*. The number of tests before and after scheduled maintenance and the mileage intervals between test points should be approximately equal. Durability test interval schedules with multiple testing at test points within 10,000 miles of or at the 50,000 mile test point must be submitted for approval. Multiple testing at maintenance mileage tests points within 10,000 miles of the 50,000 mile test points may be approved if it can be demonstrated by previously generated data that the emission effects of the maintenance are insignificant.

(4) For engine families which are to be certified to the 100,000 mile emission standards, each exhaust emission durability-data vehicle shall be driven, with all emission control systems installed and operating, for 100,000 miles or such lesser distance as the Executive Officer may agree to as meeting the objective of this procedure. Durability tests will be at every 5,000 miles, from 5,000 to 100,000 miles, however, the above procedures may be used to determine test intervals for the first 50,000 miles of testing.

(B) ~~(ii) Diesel.--Each Diesel durability-data vehicle shall be driven with all emission control systems installed and operating, for 50,000 miles or such lesser distance as the Administrator may agree to as meeting the objectives of this procedure.--Complete emission tests (see §§ 86.106 through 86.145) shall be made at the following mileage~~

* Testing before unscheduled maintenance may be omitted with the prior consent of the Executive Officer when testing would be dangerous to a vehicle or an operator.

~~points:--0;-5,000;-10,000;-15,000;20,000;-25,000;-30,000;35,000;-40,000;-45,000;-and-50,000.*--For-diesel-powered passenger-cars,-light-duty-trucks,-and-medium-duty vehicles~~ For diesel-powered vehicles equipped with periodically regenerating trap oxidizer systems, at least four regeneration emission tests (see §86.106 through §86.145) shall be made.* With the advance approval of the Executive Officer, the manufacturer may install (1) a manual override switch capable of preventing (i.e., delaying until the switch is turned off) the start of the regeneration process and (2) a light which indicates when the system would initiate regeneration if it had no override switch. Upon activation of the override switch, the vehicle will be operated on a dynamometer to precondition it for the regeneration emission test in accordance with section ~~(3.1)~~ 86.132.82 and section 9.b. of these procedures. The Urban Dynamometer Driving Schedule (UDDS) which is in progress at the time when the light comes on shall be completed and the vehicle shall proceed to the prescribed soak period followed by testing. With the advance approval of the Executive Officer, the manual override switch will be turned off at some predetermined point in the testing sequence permitting the regeneration process to proceed without further manual interaction. The mileage intervals between test points shall be approximately equal. The first regeneration emission test shall be made at the 5,000 mile point. The regeneration emission tests must provide a deterioration factor confidence level equal to or better than the confidence level achieved by performing regeneration emission tests at the following mileage point: 5,000; 20,000; 35,000; and 50,000. The procedure for making this determination is shown in Appendix IV.

(C) For gasoline-powered vehicles, the "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Gasoline Powered Motor Vehicles" specify evaporative durability testing at 5,000, 10,000, 20,000, 30,000, 40,000 and 50,000 mile test points. A manufacturer may conduct evaporative testing at test points used for exhaust emission durability testing provided that the same deterioration confidence level for the evaporative emission DF determination is retained (see Appendix III).

~~*-Where-applicable,-the-option-to-the-above-test-plan-set-forth-in-the Manufacturers-Advisory-Correspondence-#82-01A,-dated-April-6,-1982,-may-be used.~~

* Included in Appendix V are the pollutant mass emission calculation procedures for vehicles equipped with periodicaly regenerating trap oxidizer systems.

(D) The Executive Officer may determine under §86.085-24(f) that no testing is required.

3. Amend subparagraph (a)(5)(i) by adding the following requirement which reads:

In addition, the emission tests performed on emission-data vehicles and durability-data vehicles shall be non-regeneration emission tests for diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems. For any diesel passenger cars, light-duty trucks, and medium-duty vehicles equipped with continually regenerating trap oxidizer systems, manufacturers may use the provisions applicable to periodically regenerating trap oxidizer systems as an option.

If such an option is elected, all references in these procedures to vehicles equipped with periodically regenerating trap oxidizer systems shall be applicable to the vehicles equipped with continually regenerating trap oxidizer systems.

4. Amend subparagraph (a)(8) to read:

(8) Once a manufacturer submits the information required in paragraphs (a)(7) of this section for a durability-data vehicle, the manufacturer shall continue to run the vehicle to 50,000 miles if the family is certified to 50,000 mile emission standards or to 100,000 miles if it is certified to the 100,000 mile emission standards (or to a lesser distance which the Executive Officer may have previously agreed to), and the data from the vehicle will be used in the calculations under §86.084-28. Discontinuation of a durability-data vehicle shall be allowed only with the consent of the ~~Administrator~~ Executive Officer.

b. Compliance with Emission Standards

In paragraph ~~86.079-28~~ 86.088-28:

1. Amend subparagraph (a)(1) to read:

(1) Paragraph (a) of this section applies to light-duty vehicles (passenger cars, light-duty trucks and medium-duty vehicles).

2. Amend subparagraph (a)(3) to read:

(3) Since it is expected that emission control efficiency will change with mileage accumulation on a vehicle, the emission level of a vehicle which has accumulated 50,000 miles will be used as the basis for determining compliance with the 50,000 mile emission standards ~~(or family particulate emission limit, as appropriate)~~.

3. Delete subparagraph (b) (Compliance provisions for light-duty trucks).

4. Amend subparagraph (a)(4)(i) to read:

(i) Separate emission deterioration factors shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, exhaust NOx, and exhaust particulate (diesel vehicles only) for each engine-system combination. A separate evaporative emission deterioration factor shall be determined for each evaporative emission family-evaporative emission control system combination from the testing conducted by the manufacturer (gasoline-fueled vehicles only). Separate emission correction factors (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only) shall be determined from the exhaust emission results of the durability-data vehicle(s) for each engine-system combination. A separate factor shall be established for exhaust HC, exhaust CO, exhaust NOx, and exhaust particulate for each engine-system combination.

5. Delete subparagraph (a)(4)(i)(A)(4) (Outlier test point procedure)

REPLACE WITH:

(4) The manufacturer must use the outlier identification procedure to test for irregular data from a durability-data set. All durability test data must be reported. If any data point is identified as a statistical outlier, the Executive Officer will determine whether the outlier was a result of an emission control system anomaly, test procedure error or of unknown and non-recurring circumstance. The outlier is not automatically rejected under California regulations. If the procedure identifies a data point as an outlier, and an analysis by the Executive Officer shows that the outlier was caused by some irregularity of the instrumentation, only that data point will be eliminated, not all of the data (i.e., other pollutants) at that test point. Where the manufacturer choses to apply both the outlier procedure and averaging (as allowed under 86.084-26(b)(6)(i)) to the same data set, the outlier procedure shall be completed prior to applying the averaging procedure. The durability data should be submitted with the final application unless a data anomaly occurs and a staff decision is needed.

6. Amend subparagraph ~~86.079-28(a)(4)(i)(B)~~ 86.088-28(a)(4)(i)(B) (durability vehicles must meet emissions standards) by adding the additional requirement which reads:

The requirements above, refer, for each pollutant, to the highest of either the federal or California emissions

standards. The emission data will be acceptable for use in the calculation of the deterioration factor only if the interpolated 4,000-mile and 50,000-mile points on this line are within the highest of either the California or federal low-altitude emission standards.

As an exception, the Executive Officer will review the data on a case-by-case basis and may approve its use in those instances where the best fit straight line crosses an applicable standard but no data point exceeds the standard or when the best fit straight line crosses the applicable standard at the 4,000-mile point but the 5,000-mile actual test point and the 50,000 mile interpolated points are both below the standards.

7. Add subparagraph (a)(4)(i)(D) to read:

(D) The regeneration exhaust emission data (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only) from the tests required under ~~§86.079-26(a)(4)~~ §86.084-26(a)(4) shall be used to determine the regeneration exhaust emissions interpolated to the 50,000-mile point. The regeneration exhaust emission results shall be plotted as a function of the mileage on the system, rounded to the nearest mile, and the best fit straight lines, fitted by the method of least squares, shall be drawn through all these data points. The interpolated 50,000-mile point of this line shall be used to calculate the multiplicative exhaust emission correction factor for each engine-system combination as follows:

$$\text{Factor} = 1 + \frac{R-1}{4505} \; n$$

where, R = the ratio of the regeneration exhaust emissions interpolated to 50,000 miles to the non-regeneration exhaust emissions interpolated to 50,000 miles.

n = the number of complete regenerations which occur during the durability test.

These interpolated values shall be carried out to a minimum of four places to the right of the decimal point before dividing one by the other to determine the correction factor. The results shall be rounded to three places to the right of the decimal point in accordance with ASTM E 29-67. For applicability to gaseous emission standards under the 100,000 mile option, R will be determined based upon projected 100,000 mile emissions.

8. Amend subparagraph (a)(4)(ii)(A) to read:

(A) The official exhaust emission test results for each

emission-data vehicle at the 4,000 mile test point shall be multiplied by the appropriate deterioration factor, and correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only): Provided: that if a deterioration factor as computed in paragraph (a)(4)(i)(B) of this section or a correction factor as computed in paragraph (a)(4)(i)(D) of this section is less than one, that deterioration factor or correction factor shall be one for the purposes of this paragraph.

7. Small-Volume Manufacturer's Certification Procedures

a. In paragraph 86.084-14:

1. Amend subparagraph (b)(1) to read:

(1) The optional small-volume manufacturers certification procedures apply to light-duty vehicles (passenger cars, light-duty trucks, and medium-duty vehicles), ~~light-duty trucks, and heavy-duty engines~~ produced by manufacturers with ~~U.S.~~ California sales (for the model year in which certification is sought) of fewer than ~~10,000~~ 3,000 units (~~PC LDV~~, LDT and MDV ~~HDE~~ combined).

2. Amend subparagraph (c)(4) to read:

(4) A small-volume manufacturer shall include in its records all of the information that ~~EPA~~ ARB requires on ~~§ 86.084-21~~ § 86.088-21. This information will be considered part of the manufacturer's application for certification and must be submitted to the Executive Officer. ~~However, the manufacturer is not required to submit the information to the Administrator unless the Administrator requests it.~~

3. Delete subparagraph (c)(7)(i)(A) (Worst-case selection of emission-data vehicles).

8. Alternative Procedures for Notification of Additions and Changes

a. Amend subparagraph 86.082-34(a) by adding the following additional requirements which read:

A manufacturer must notify the Executive Officer within 10 working days of making an addition of a vehicle to a certified engine family or a change in a vehicle previously covered by certification.

The manufacturer shall also submit, upon request of the Executive Officer, the following items:

(1) service bulletin.
(2) driveability statement.
(3) test log.
(4) maintenance log.

All running changes and field fixes which do not adversely affect the system durability are deemed approved unless disapproved by the Executive Officer within 30 days of the receipt of the running change or field fix request. A change not specifically identified in the manufacturer's application must also be reported to the Executive Officer if the change may adversely affect engine or emission control system durability. Examples of such changes include any change that could affect durability, thermal characteristics, deposit formation, or exhaust product composition, i.e., combustion chamber design, cylinder head material, camshaft profile, computer modifications, turbocharger, intercooler, wastegate characteristics, and transmission or torque converter specifications. Note that this section does not affect the California "blanket" approval provisions.

The manufacturer is required to update and submit to the Executive Officer the "supplemental data sheet" for all running changes and field fixes implemented with the change notification. The manufacturer shall submit, on a monthly basis, by engine family, a list of running changes/field fixes giving the document number, date submitted and a brief description of the change.

9. Test Requirements

a. Fuel Specification

Amend ~~subparagraph 86.113-78~~ 86.113-87 by adding a new subparagraph ~~(e)~~(d) to read:

(1) Gaseous fuels representative of commercial gaseous fuels which will be generally available through retail outlets in California or liquid petroleum gas having the ASTM D1835 or NGPA HD-5 specification shall be used in service accumulation.

(2) Liquid petroleum gas having the ASTM D1835 or NGPA HD-5 specification shall be used for exhaust and evaporative emission testing.

(3) Natural gas representative of commercial natural gas which will be generally available through retail outlets in California shall be used for exhaust emission testing.

(4) Written approval from the Administrator of the fuel specifications must be provided prior to the start of the testing.

b. Vehicle preconditioning

In paragraph ~~86.132-78~~ 86.132-82:

1. Amend subparagraph (a)(2) to read:

(2) Within one hour of being fueled the vehicle shall be placed, either by being driven or pushed, on a dynamometer and

placed, either by being driven or pushed, on a dynamometer and operated through one Urban Dynamometer Driving Schedule (UDDS) test procedure, see §86.115 and Appendix I of the federal procedures.

The UDDS performed prior to a non-regeneration emission test shall not contain a regeneration (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). A gasoline fueled test vehicle may not be used to set dynamometer horsepower.

2. Amend subparagraph (a)(3) to read:

(3) For those unusual circumstances where additional preconditioning is desired by the manufacturer, such preconditioning may be allowed with the advance approval of the ~~Administrator~~ Executive Officer. The ~~Administrator~~ Executive Officer may also choose to conduct or require the conduct of additional preconditioning to insure that the evaporative emission control system is stabilized in the case of gasoline engines, or to insure that the exhaust system is stabilized in the case of diesel engines. The additional preconditioning shall consist of an initial one hour minimum soak and, one, two, or three driving cycles of the UDDS (or more in the case of a diesel-powered vehicle equipped with a periodically regenerating trap oxidizer system, which is being preconditioned for a regeneration emission test), as described in paragraph (a)(2) of this section, each followed by a soak of at least one hour with engine off, engine compartment cover closed and cooling fan off. The vehicle may be driven off the dynamometer following each UDDS for the soak period.

c. Regeneration Recording Requirements

Amend paragraph 86.142-82 by adding the following subparagraph (r) which reads:

(r) The manufacturer shall record in the durability-data vehicle log book, the number of regenerations which occur during the 50,000 mile durability test of each diesel-powered passenger car, light-duty truck and medium-duty vehicle equipped with a periodically regenerating trap oxidizer system. The manufacturer shall include, for each regeneration: the date and time of the start of regeneration, the duration of the regeneration, and the accumulated mileage at the start and the end of regeneration. The number of regenerations will be used in the calculation of the correction factor in 40 CFR Part 86, Section 28.

10. Optional 100,000 Mile Certification Procedure

The following provisions and alternate emission standards shown in ~~paragraph~~ section (3) of these procedures shall apply to any engine

family ~~which meets all of the following additional requirements~~ certified to the 100,000 mile certification standards*.

a. General Guidelines for Implementation

1. Designation

The manufacturer shall designate in the preliminary application for certification those engine families that will be certified to the 100,000 mile procedures. In order to allow the manufacturer as much flexibility as possible, the manufacturer may at any time designate additional engine families or remove any designated engine family. Families originally intended for 50,000 mile certification may be designated as 100,000 mile families after the start of durability testing and vice versa. The Executive Officer must be notified within ten working days of any such changes. Manufacturers are cautioned that any engine family certified to the 100,000 mile certification procedure must comply with the allowable maintenance provisions of section 10.b in these procedures during the engine mileage accumulation.

2. Mileage Accumulation

All durability vehicles must be run to at least 50,000 miles. For established emission control systems, early termination of mileage accumulation may be requested by the manufacturer if sufficient evidence as described below is provided to satisfy the Executive Officer that further testing is unnecessary.

Testing beyond 50,000 miles must be conducted in accordance with the certification test procedures applicable prior to 50,000 miles. Exhaust emissions tests shall be performed at every 5,000 mile interval starting with the 55,000 mile point and ending with the 100,000 mile point, and before and after all scheduled maintenance.

The Executive Officer may, upon request by the manufacturer, waive any exhaust emission testing beyond 50,000 miles, if he or she finds that (1) the extrapolated 100,000 mile points and interpolated 4,000 mile points on the least squares lines comply with the line crossing provisions of section 10.b. of the procedures, and (2) the system and engine designs, on the basis of previous engineering experience, would not be expected to exceed the applicable standards after 100,000 miles. For example, a diesel vehicle that shows a flat deterioration curve (D.F. = 1.0) for the first 50,000 miles

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* The additional criteria outlined in Section 6.a. (Mileage and Service Accumulation: Emission Measurements) shall be used to determine the durability-data testing schedule and the emission-data 4,000 mile test point.

and which is not equipped with any add-on emission control system (such as EGR) may be eligible for such a waiver. The Executive Officer will evaluate each request on a case-by-case basis. The manufacturer must submit its request to the Executive Officer to stop testing within ten working days after the last emission test.

If a durability vehicle accumulates less than 100,000 miles, the manufacturer shall submit evidence that the engine is capable of meeting the applicable emission standards for 100,000 miles. Such evidence shall include engineering data on piston rings, piston, valves, cylinder head, fuel system, ignition system, etc., as applicable.

Any decision to stop mileage accumulation before 100,000 miles does not relieve the manufacturer from its warranty and recall obligations.

For the last 50,000 miles, the Executive Officer may, upon the request of the manufacturer, allow driving schedules different from the standard AMA driving cycle for accelerated mileage accumulation and a reduced test frequency. The evaluation of alternate test programs will be based on the type of emission control system involved and the characteristic of the cumulative emission control system deterioration.

3. Scheduled Maintenance

A vehicle manufacturer who initially intends to certify a vehicle to the 50,000 mile procedure may not change to the 100,000 mile option after mileage accumulation unless the manufacturer starts initial mileage accumulation using, for each maintenance item, the most stringent maintenance schedule of either the 100,000 mile option or the 50,000 mile certification requirements.

4. Unscheduled Maintenance

The Executive Officer will follow the provisions of section 5.a of these procedures, in evaluating any manufacturer's request for unscheduled maintenance. Manufacturers shall obtain the Executive Officer's approval before performing any unscheduled emission control component/system maintenance. In all cases, the degree of system degradation must not be improved by any inspection or repairs. Emission tests must be performed before and after all unscheduled maintenance and be used in the DF calculation*.

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* Testing before unscheduled maintenance may be omitted with the prior consent of the Executive Officer when testing would be dangerous to a vehicle or an operator.

5. Evaporative Compliance Criteria

If a manufacturer conducts evaporative emission testing (gasoline-powered vehicles only) in conjunction with exhaust durability testing, the vehicle manufacturer is required to show compliance with the evaporative emission standard for 50,000 miles. If the manufacturer wishes to conduct testing beyond 50,000 miles, all data must be submitted to the Executive Officer. The Executive Officer will not use any evaporative emission data beyond 50,000 miles for determining compliance with the applicable evaporative emission standard. However, the manufacturer must warrant the evaporative emission control system for 10 years or 100,000 miles.

b. Specific Guidelines for Compliance

Each exhaust emission durability data vehicle shall be driven, with all emission control systems installed and operating, for 100,000 miles or such lesser distance as the Executive Officer may agree to as meeting the objectives of this procedure. Emission tests performed on emission-data vehicles and durability-data vehicles (for determination of the deterioration factors) shall be non-regeneration emission tests for diesel-powered passenger cars, light-duty trucks and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems. Compliance with the emission standards shall be established as follows:

1. The linear regression line for all pollutants shall be established by use of all required data from tests of the durability vehicle at every 5,000 mile interval from 5,000 to 100,000 miles. The requirements in subparagraph ~~86.078-28(a)(4)(i)(B)~~ 86.088-28(a)(4)(i)(B) (durability vehicles must meet emissions standards) refer, for each pollutant, to the highest of either the federal 50,000 mile or California 100,000 mile emission standards.

2. Compliance with the hydrocarbon and carbon monoxide standards shall be determined as follows:

   i. For Option 1:

      A. The interpolated 4,000 and 50,000 mile points on the linear regression line in section b.1. shall not exceed the appropriate hydrocarbon and carbon monoxide standards, except as in B. below.

      B. The linear regression line in section b.1. may exceed the standard provided that no data point exceeds the standard.

C. The hydrocarbon and carbon monoxide data from the 4,000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 50,000 mile point by the interpolated 4,000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate hydrocarbon and carbon monoxide standards.

ii. For Option 2:

A. The interpolated 4,000 and 100,000 mile points on the linear regression line in section b.1. shall not exceed the appropriate hydrocarbon and carbon monoxide standards, except as in B below.

B. The linear regression line in section b.1. may exceed the standard provided that no data point exceeds the standard.

C. The hydrocarbon and carbon monoxide data from the 4,000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 100,000 mile point by the interpolated 4,000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate 100,000 mile hydrocarbon and carbon monoxide standards.

3. Compliance with the oxides of nitrogen standard for Options 1 and 2 shall be determined as follows:

i. the interpolated 4,000 and 100,000 mile points on the linear regression line in section b.1. shall not exceed the appropriate 100,000 mile oxides of nitrogen standard, except as in ii. below.

ii. the linear regression line in section b.1. may exceed the standard provided that no data point exceeds the standard.

iii. the oxides of nitrogen data from the 4,000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 100,000 mile point by the interpolated 4,000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with

periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate 100,000 mile oxides of nitrogen standard.

4. Compliance with the particulate standard for options 1 and 2 shall be determined as follows:

   i. the interpolated 4,000 and 50,000 mile points on the linear regression line in section b.1. shall not exceed the appropriate particulate standard, except as in ii. below.

   ii. the linear regression line in section b.1. may exceed the standard provided that no data point exceeds the standard.

   iii. the particulate data from the 4,000 mile test point of the emission data vehicle shall be multiplied by the deterioration factor computed by dividing the interpolated 50,000 mile point by the interpolated 4,000 mile point, and the appropriate exhaust emission correction factor (diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles equipped with periodically regenerating trap oxidizer systems only). These values shall not exceed the appropriate particulate standard.

5. All references in these test procedures to "useful life", 5 years, and 50,000 miles shall mean "total life", 10 years, and 100,000 miles, respectively, except in section 10.b.2.

c. Maintenance

Only the following scheduled maintenance shall be allowed under subparagraph ~~86.078-25(a)(1)(i)~~ 86.085-25 (a)(1)(i).

1. 25(a)(1)(i) Option 1. For ~~1981~~ 1988 and later model gasoline or diesel-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated.

   (1) Drive belt tension on engine accessories (30,000 miles).
   (2) Valve lash (15,000 miles).
   (3) Spark plugs (30,000 miles).
   (4) Air filter (30,000 miles).
   (5) Exhaust gas sensor (30,000 miles): Provided that~~,-for 1987-and-prior-model-years,-an-audible-and/or-visible signal-approved-by-the-Executive-Officer-alerts-the vehicle-operator-to-the-need-for-sensor-maintenance-at the-mileage-point;-and-provided-that-for-1988-and subsequent-model-year-vehicles~~;:

(a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is again reached and shall again remain activated until reset. When the maintenance indicator consists of a light, it shall also activate automatically in the engine-run key position before engine cranking to indicate that it is functioning. The maintenance indicator shall be located on the instrument panel and shall, when activated, display the words "oxygen sensor" or may display such other words determined by the Executive Officer to be likely to cause the vehicle owner to seek oxygen sensor replacement. The maintenance indicator shall be separate from the malfunction indicator light required by Section 1968, Title 13, California Administrative Code;

(b) the manufacturer shall provide free replacement of the oxygen sensor, including both parts and labor, and shall reset the maintenance indicator without any charge, the first time the maintenance interval established during certification testing is reached for vehicles certified with scheduled sensor maintenance before 50,000 miles. If the oxygen sensor is replaced pursuant to the warranty provisions of Section 2037, Title 13, California Administrative Code, before the first maintenance interval is reached, the manufacturer shall also replace the oxygen sensor and reset the maintenance indicator at the mileage point determined by adding the maintenance interval to the vehicle's mileage at the time of the warranty replacement. If the calculated mileage point for a second oxygen sensor replacement would exceed 50,000 miles, no free second replacement shall be required;

(c) the maintenance indicator shall be resettable. The maintenance instructions required by paragraph 5.b. of these procedures shall provide instructions for the resetting of the maintenance indicator, and shall specify that the maintenance indicator shall be reset each time the oxygen sensor is replaced; and

(d) notwithstanding the provisions of Section 2037(c), Title 13, California Administrative Code, the oxygen sensor, including any replacement required pursuant to this section, shall be warranted for the useful life of the vehicle or engine. If such oxygen sensor fails during the useful life period, it shall be replaced by the manufacturer in accordance with Section 2037(d) Title 13, California Administrative Code.

(6) Choke, cleaning or lubrication only (30,000 miles).
(7) Idle speed (30,000 miles).
(8) Fuel Filter (30,000 miles).
(9) Injection timing (30,000 miles).

Option 2. For ~~1981~~ 1988 and later model gasoline or diesel-fueled vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intervals no more frequent than indicated:

(1) Drive belt tension on engine accessories (30,000 miles).
(2) Valve lash (15,000 miles).
(3) Spark plugs (30,000 miles).
(4) Air filter (30,000 miles).
(5) Fuel filter (30,000 miles).
(6) Idle speed (30,000 miles).
(7) Injection timing (30,000 miles).

2. In addition, adjustment of the engine idle speed (curb idle and fast idle), valve lash, and engine bolt torque may be performed once during the first 5000 miles of scheduled driving, provided the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

d. The manufacturer shall agree to apply to vehicles certified under this paragraph the provision of Section 43204 of the California Health and Safety Code for a period of ten years or 100,000 miles, whichever first occurs.

11. Additional Requirements

a. In order to qualify for the alternative durability program, in addition to the requirements of paragraph 86.085-13, the algorithm requirements of Appendix III shall be met and only the first 50,000 miles (or 100,000 miles, as applicable) of data or its equivalent shall be used.

b. For gasoline-powered vehicles, evidence shall be supplied showing that the air/fuel metering system or secondary air injection system is capable of providing sufficient oxygen to theoretically allow enough oxidation to attain the CO emission standards at barometric pressures equivalent to those expected at altitudes ranging from sea level to 6000 feet elevations.

A vehicle will be deemed in compliance with the above requirement if the manufacturer demonstrates that the tailpipe air/fuel ratio (TAFR) is, at elevations up to 6000 feet, stoichiometric or leaner in each of several driving modes. However, if a vehicle operates in a given driving mode at sea level with a TAFR richer than stoichiometric, then for that particular driving mode the manufacturer is only required to show that the TAFR is, at elevations up to 6000 feet, no richer than the TAFR at sea level. The driving modes selected for testing shall be representative of the full range of normal driving conditions, and shall include the following three steady-state modes: idle, 30 mph road load cruise, 50 mph road load cruise. Assuming the use of dry air and indolene fuel (hydrogen to carbon atom ratio of 1.85), a TAFR of 14.6 shall be considered a stoichiometric ratio. The vehicle manufacturer may correct this value for different fuels and/or humidity, subject to approval by the Executive Officer.

For fuel injected vehicles, compliance may be demonstrated upon a showing by the manufacturer that the fuel injection system distributes fuel based on air mass flow, rather than volume flow, and is therefore self-compensating. All submitted test proposals will be evaluated on their acceptability by the Executive Officer.

As an alternative to the demonstration described above, a manufacturer may demonstrate compliance by testing California vehicle configurations as part of its federal high altitude certification requirements. Engine families which meet all the applicable California low altitude emission standards when tested at the EPA test elevation are deemed to be in compliance.

Exemptions to the high altitude provisions as allowed by the federal government in §86.087-8 and §86.088-9 shall not be approved.

c. The exhaust emissions shall be measured from all exhaust emission data vehicles tested in accordance with the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B). The oxides of nitrogen emissions measured during such tests shall be multiplied by the oxides of nitrogen deterioration factor computed in accordance with paragraph ~~86.078-28~~ 86.088-28, and then rounded and compared with the standard as set forth in section 3 preceding. All data obtained pursuant to this paragraph shall be reported in accordance with procedures applicable to other exhaust emissions data required pursuant to these procedures.

In the event that one or more of the manufacturer's emission data vehicles fail the HWFET standard listed in section 3, the manufacturer may submit to the Executive Officer engineering data or other evidence showing that the system is capable of complying with the standard. If the Executive Officer finds, on the basis of an engineering evaluation, that the system can comply with the HWFET standard, he or she may accept the information supplied by the manufacturer in lieu of vehicle test data.

~~d. If a gasoline-fueled vehicle manufacturer requires the use of unleaded fuel, a statement will be required that the engine and transmission combinations for which certification is requested are designed to operate satisfactorily on a gasoline having a research octane number not greater than 91. This requirement shall not apply to gaseous-fueled vehicles.~~

d. Labeling required pursuant to paragraph ~~86.079-35~~ 86.088-35 and Section 1965, Chapter 3, Title 13 of the California Administrative Code shall conform with the requirements specified in the "California Motor Vehicle Tune-Up Label Specifications".

e. The manufacturer shall submit to the Executive Officer a statement that those vehicles for which certification is requested have driveability and performance characteristics which satisfy that manufacturer's customary driveability and performance requirements for vehicles sold in the United States. This statement shall be based on driveability data and other evidence showing compliance with the manufacturer's performance criteria. This statement shall be supplied with the manufacturer's final application for certification, and with all running changes for which emission testing is required.

If the Executive Officer has evidence to show that in-use vehicles demonstrate poor performance that could result in wide-spread tampering with the emission control systems, he or she may request all driveability data and other evidence used by the manufacturer to justify the performance statement.

f. For all vehicles subject to the provisions of Section 1968, Title 13, California Administrative Code, the manufacturer shall submit with its application for certification a description of the malfunction and diagnostic system to be installed on the vehicles. (The vehicles shall not be certified unless the Executive Officer finds that the malfunction and diagnostic system complies with the requirements of Section 1968).

g. Certification, if granted, is effective only for the vehicle/engine family described in the original manufacturer's certification application. Modifications by a secondary manufacturer to vehicles/engines shall be deemed not to increase emissions above the standards under which those vehicles/engines were certified and to be within the original certification if such modifications do not: (1) increase vehicle weight more than 10 percent above the curb weight, increase frontal area more than 10 percent, or result in a combination increase of weight plus frontal area of more than 14 percent; or (2) include changes in axle ratio, tire size, or tire type resulting in changes in the drive train ratio of more than 5 percent; or (3) include any modification to the emission control system. No originally certified vehicle/engine which is modified by a secondary manufacturer in a manner described in items (1) through (3) of the preceding sentence may be sold to an

ultimate purchaser, offered or delivered for sale to an ultimate purchaser, or registered in California unless the modified vehicle/engine is certified by the state board in accordance with applicable test procedures to meet emission standards for the model year for which the vehicle/engine was originally certified.

For the purposes of this subsection, "secondary manufacturer" means any person, other than the original manufacturer, who modifies a new motor vehicle prior to sale to the ultimate purchaser.

h. A statement must be supplied that the production vehicles shall be in all material respects the same as those for which certification is granted.

~~e. The mechanism for adjusting the idle air/fuel mixture, if any, shall be designed so that either:~~

~~(i) The mixture adjustment mechanism is not visible, even with the air cleaner removed, and special tools and/or procedures are required to make adjustments; or~~

~~(ii) In the alternative, the Executive Officer may, upon reasonable notice to the manufacturer, require that a certification test of a vehicle be conducted with the idle air/fuel mixture at any setting which the Executive Officer finds corresponds to settings likely to be encountered in actual use. The Executive Officer, in making this finding, shall consider the difficulty of making adjustments, damage to the carburetor in the event of any effort to make an improper adjustment, and the need to replace parts following the adjustment.~~

~~The manufacturer shall submit for approval by the Executive Officer his or her proposed method for compliance with this requirement in his or her preliminary application for certification.~~

APPENDIX I

List of Sections of Subparts A and B, Part 86, Title 40, Code of Federal Regulations, Incorporated by Reference

This Appendix sets forth the sections of Subparts A and B, Part 86, Title 40, Code of Federal Regulations, as adopted or amended by the U.S. Environmental Protection Agency (EPA) on the date listed for each section, which are incorporated by reference in "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles."

All of the incorporated federal provisions were in effect as of ~~August 30, 1985~~ July 7, 1986. Seven additional sections adopted by EPA prior to ~~August 30, 1985~~ July 7, 1986 and applicable to 1991 and subsequent model vehicles are not included: Sections 86.91-2, 86.91-21, 86.91-23, 86.91-28, 86.91-29, 86.91-30, and 86.91-35. However, the terms of these sections as they pertain to passenger cars, light-duty trucks, and medium-duty vehicles are identical to the corresponding incorporated federal sections applicable commencing with 1988 model year vehicles: Sections 86.88-2, 86.88-21, 86.88-23, 86.88-28, 86.88-29, 86.88-30, and 86.88-35.

Subpart A - General Provisions for Emission Regulations for 1977 and Later Model Year New Light-Duty Vehicles, 1977 and Later Model Year New Light-Duty Trucks.

§86.085-1	General applicability. ~~March 15, 1985~~ July 7, 1986.
§86.082-2	Definition. November 2, 1982.
§86.084-2	Definition. December 10, 1984.
§86.085-2	Definition. November 16, 1983.
§86.088-2	Definition. March 15, 1985.
§86.078-3	Abbreviations. January 21, 1980.
§86.084-4	Section numbering; construction. September 25, 1980.
§86.084-5	General standards; increase in emissions,; unsafe conditions. November 3, 1982.
§86.078-7	Maintenance of records; submitted information; right of entry. November 2, 1982.
§86.087-8	Emission standards for 1987 light duty vehicles. January 24, 1984.
§86.088-9	Emission standards for 1987 model light-duty trucks. ~~March 15, 1985~~ July 7, 1986.
§86.080-12	Alternative certification procedures. April 17, 1980.
§86.085-13	Alternative durability program. May 19, 1983.
§86.084-14	Small-volume manufacturers certification procedures. January 31, 1985.
§86.085-20	Incomplete vehicles. January 12, 1983.
§86.088-21	Application for certification. March 15, 1985.
§86.085-22	Approval of application for certification; test fleet selection, etc., ~~August 30, 1985~~ July 7, 1986.
§86.088-23	Required data. July 19, 1985.
§86.085-24	Test vehicles and engines. January 31, 1985.
§86.085-25	Maintenance. ~~November 16, 1983~~ July 7, 1986.

§86.087-25 Maintenance. March 15, 1985 July 7, 1986.
§86.088-25 Maintenance. March 15, 1985 July 7, 1986.
§86.084-26 Mileage and service accumulation; emission measurements. October 19, 1983 July 7, 1986.
§86.085-27 Special test procedures. January 12, 1983.
§86.088-28 Compliance with emission standards. March 15, 1985 July 7, 1986.
§86.088-29 Testing by the Administrator. March 15, 1985.
§86.088-30 Certification. January 24, 1984.
§86.079-31 Separate certification. September 8, 1984.
§86.079-32 Addition of a vehicle or engine after certification. September 8, 1977.
§86.079-33 Changes to a vehicles or engine covered by certification. September 8, 1977.
§86.082-34 Alternative procedures for notification of addition and changes. November 2, 1982.
§86.088-35 Labeling. March 15, 1985 December 31, 1985.
§86.079-36 Submission of vehicle identification numbers. November 14, 1978.
§86.085-37 Production vehicles and engines. January 12, 1983.
§86.085-38 Maintenance instructions. November 16, 1983 July 7, 1986.
§86.087-38 Maintenance instructions. March 15, 1985.
§86.079-39 Submission of maintenance instructions. September 8, 1977.
§86.084-40 Automatic expiration of reporting and record keeping requirements. September 25, 1980.

Subpart B-Emission Regulations for 1977 and later Model Year New Light-Duty Vehicles and New Light-Duty Trucks Test Procedures.

§86.101 General applicability. June 28, 1977.
§86.102 Definitions. March 5, 1980.
§86.103 Abbreviations. March 5, 1980.
§86.104 Section numbering, construction. June 28, 1977.
§86.105 Introduction; structure of subpart. March 5, 1980.
§86.106-82 Equipment required; overview. March 5, 1980.
§86.107-78 Sampling and analytical system, evaporative emissions. June 28, 1977.
§86.108-79 Dynamometer. September 12, 1977.
§86.109-82 Exhaust gas sampling system; gasoline-fueled vehicles. March 5, 1980.
§86.110-82 Exhaust gas sampling system; diesel vehicles. October 13, 1981.
§86.111-82 Exhaust gas analytical system. March 5, 1980.
§86.112-82 Weighing chamber (or room) and microgram balance specifications. March 5, 1980.
§86.113-82 Fuel Specification. December 10, 1984.
§86.113-87 Fuel Specification. July 7, 1986.
§86.114-79 Analytical gases. November 14, 1978.
§86.115-78 EPA urban dynamometer driving schedules. June 28, 1977.
§86.116-82 Calibrations, frequency and overview. March 5, 1980.
§86.117-78 Evaporative emission enclosure calibrations. June 28, 1977.
§86.118-78 Dynamometer calibration. June 28, 1977.
§86.119-78 CVS calibration. June 28, 1977.
§86.120-82 Gas meter or flow instrumentation calibration, particulate measurement. March 5, 1980.

§86.121-82 Hydrocarbon analyzer calibration. March 5, 1980.
§86.122-78 Carbon monoxide analyzer calibration. June 28, 1977.
§86.123-78 Oxides of nitrogen analyzer calibration. September 12, 1977.
§86.124-78 Carbon dioxide analyzer calibration. June 28, 1977.
§86.126-78 Calibration of other equipment. June 28, 1977.
§86.127-82 Test procedures; overview. March 5, 1980.
§86.128-79 Transmission. November 14, 1978.
§86.129-80 Road load power test weight and inertia weight class determination. November 14, 1978.
§86.130-78 Test sequence; general requirements. November 14, 1978.
§86.131-78 Vehicle preparation. June 28, 1977.
§86.132-82 Vehicle preconditioning. March 5, 1980.
§86.133-78 Diurnal breathing loss test. November 16, 1983.
§86.134-78 Running loss test. December 10, 1984.
§86.135-82 Dynamometer procedure. December 10, 1984.
§86.136-82 Engine starting and restarting. March 5, 1980.
§86.137-82 Dynamometer test run, gaseous and particulate emissions. March 5, 1980.
§86.138-78 Hot soak test. June 28, 1977.
§86.139-82 Diesel particulate filter handling and weighing. March 5, 1980.
§86.140-82 Exhaust sample analysis. March 5, 1980.
§86.142-82 Records required. March 5, 1980.
§86.143-78 Calculations; evaporative emissions. March 15, 1985.
§86.144-78 Calculations; exhaust emissions. December 10, 1984.
§86.145-82 Calculations; particulate emissions. October 13, 1981.

APPENDIX II

Exhaust Emission-Data Vehicle Selection Criteria For Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles

I. Selection of Exhaust Emission-Data Vehicles (see flow diagram on page II-4)

A. Item 1 of the attached emission-data vehicle selection worksheet (page II-5) shall be prepared with the highest projected sales engine displacement-system combination first and the remainder in order of decreasing projected sales volume.

B. For engine families with a single engine displacement-exhaust emission control system combination representing 70 percent or more of the projected sales.

1. The first vehicle selection will be determined as follows:

a. The engine displacement-exhaust emission control system combination shall be the one with the highest projected sales. (Item 1, on worksheet.)

b. Using the data entered in Item 2 of the worksheet and the formula shown below, the equivalent test weight of the vehicle is determined from the calculated sales weighted equivalent test weight for that engine displacement-exhaust emission control system combination.

Sales Weighted Test Weight

Determine the sales weighted test weight as follows:

T_i = Test weight of i'th class

S_i = Sales volume of i'th class

N = Number of test weight classes

SWTW = Sales Weighted Test Weight

$$SWTW = \frac{\sum_{i=1}^{N} S_i T_i}{\sum_{i=1}^{N} S_i}$$

Select the equivalent test weight that includes the calculated SWTW. If the SWTW is exactly between two equivalent test weights, select the higher equivalent test weight. Similarly, if there are no vehicles with the desired displacement-exhaust emission control system combination in the same equivalent test weight that includes the calculated SWTW, the next higher equivalent test weight that contains such a vehicle will be specified.

c. The transmission will be the class with the highest sales for the engine displacement-exhaust emission control system combination (Item 3, worksheet). If the highest sales transmission class is not available in the equivalent test weight determined in (b), above, the next higher equivalent test weight with the highest sales transmission class will be selected. If manual transmissions are the highest selling class, the transmission configuration with the highest sales should generally be selected (Item 4, worksheet. If the manufacturer wishes to test a vehicle with an M-4 transmission both as an M-4 vehicle and an M-3 vehicle, use of the vehicle with an M-4 transmission will be allowed provided the first three gear ratios are identical in both transmissions. Similarly, use of an M-5 will be allowed to represent both an M-5 vehicle and an M-4 vehicle, providing the first four gear ratios are identical in both transmissions.

d. The highest selling engine code within the engine displacement-exhaust emission control system-equivalent test weight-transmission class combination will be specified (Item 5, worksheet).

e. The highest selling body style within the engine displacement-exhaust emission control system-equivalent test weight-transmission class-engine code combination will be specified (Item 6, worksheet.)

f. The N/V ratio will be the standard ratio (standard tire and axle ratio combination) for the vehicle selected (Item 7, worksheet).

g. Standard or optional equipment that can reasonably be expected to influence emissions (Item 8, worksheet) and is expected to be installed on more than 33 percent of the vehicles in the car line within the engine-system combination shall be specified (and the full estimated weight of those items should be included in the curb weight computation) unless an item is not available on the particular vehicle specified. Other standard or optional equipment expected to be installed on more than 33 percent of the vehicles in the car line within the engine-system combination shall have their full estimated weight included in the curb weight computation and be included in the specified vehicle's weight. Overdrive units are considered transmission configurations and not items of optional equipment. The weight of an overdrive unit should be included in the curb weight computation of vehicles with such units. (In other words, the weight of overdrive units should not be disregarded when car line sales of such items are 33 percent or less.)

2. The second vehicle will be determined as follows:

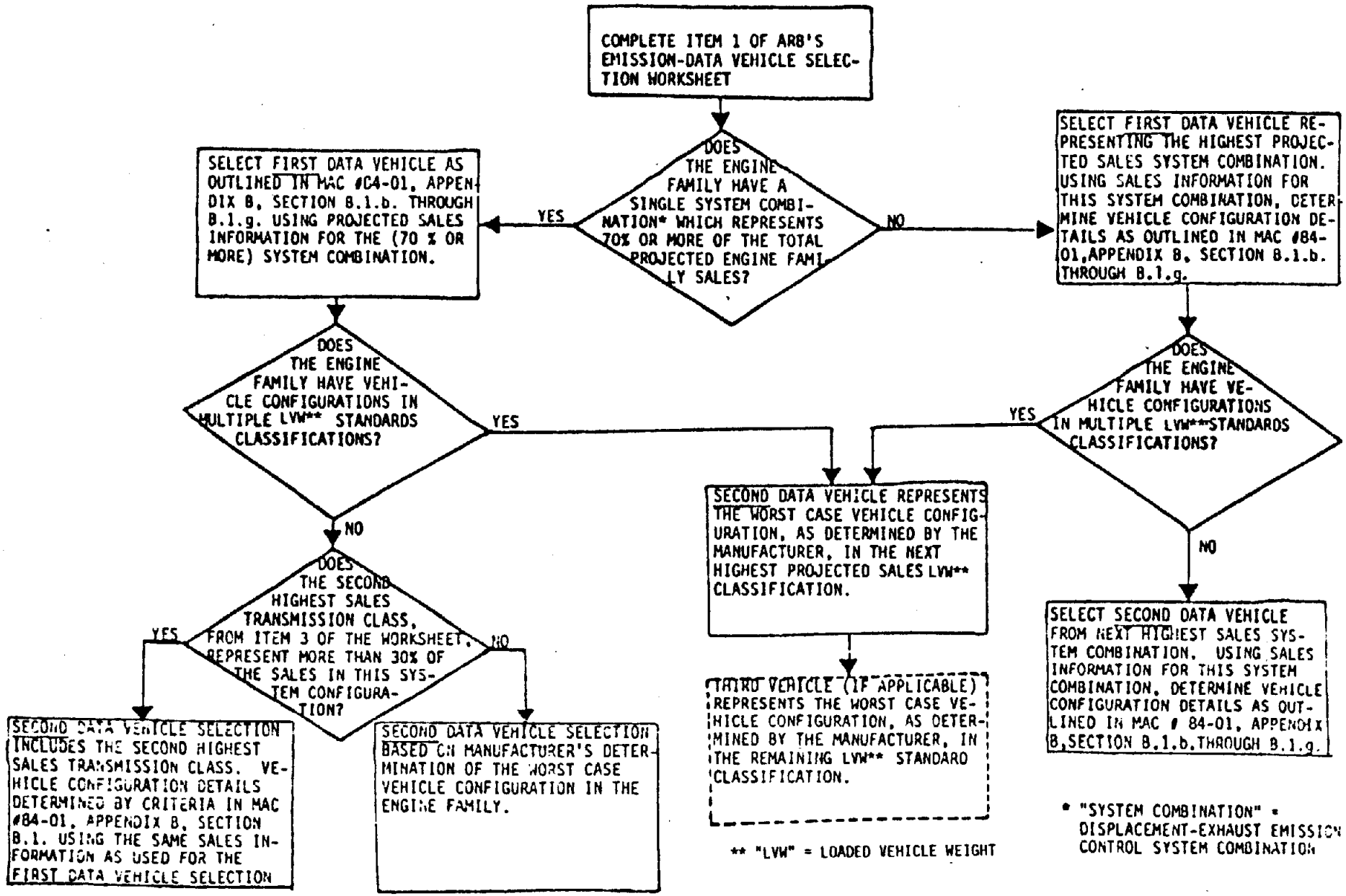
a. The transmission class, from Item 3 of worksheet, with the second highest sales will be specified if this transmission class has projected sales of more than 30 percent of the engine displacement-exhaust emission control system combination. The equivalent test weight, engine code, body style, N/V ratio, and optional equipment specified for the second vehicle are determined by criteria in Section 1.

b. If the second transmission class does not meet the criteria of 2.a. above, the second vehicle will be the worst case vehicle selected from the family.

c. For engine families with multiple displacement-emission control system combinations, the first vehicle selection will be highest sales combination, and the second vehicle selection will be second highest sales combination. Other vehicle configuration details will be as in Section B.1.b. through B.1.g.

d. An exception to the two maximum emission-data vehicles may occur for engine families with vehicles in multiple standard classifications, i.e., loaded vehicle weight classifications for light-duty trucks and/or medium-duty vehicles. The first vehicle selection will be determined as above in B.1. in the highest sales loaded vehicle weight classification, and the subsequent vehicle selection(s) will be a worst case vehicle(s) in the other loaded vehicle weight classification(s).

FLOW DIAGRAM FOR SELECTING ARB
PC, LDT AND MDV EXHAUST EMISSION-DATA VEHICLES



** "LVW" = LOADED VEHICLE WEIGHT

* "SYSTEM COMBINATION" = DISPLACEMENT-EXHAUST EMISSION CONTROL SYSTEM COMBINATION

Emission-Data Vehicle Selection Worksheet

Manufacturer_____ Date_____

Engine Family_____

1.

	Engine Displacement	Emission Control System	Unit	Percent	Cummulative%
a)					
b)					
c)					
d)					

2. Sales Weighted Test Weight

Total projected sales_____

	Test Weight - lb.	Sales Volume
a)		
b)		
c)		
d)		

Calculated SWTW_____lbs. Equivalent Test Weight_____lbs.

3. Transmission Selection

	Class	Sales Volumes	Percentage Sales	High Sales
a)				
b)				

4. Transmission Configuration

	Configuration	Sales Volumes	High Sales
a)			
b)			
c)			

5. Engine Code (within 1, 2, 3, and 4 above)	Sales Volumes	High Sales
a)		
b)		
c)		
d)		

6. Body Style (within 1, 2, 3, 4, and 5 above)	Sales Volumes	High Sales
a)		
b)		
c)		
d)		
e)		
f)		

7. STD Axle _____ STD N/V _____

8. Options over 33 percent

9. Second and Subsequent Selections Vehicles

a) High Sales Engine Displacement-Exhaust Emission Control System _____

b) Second-Highest Selling Transmission Class _____

Designated Second and Subsequent Selections Vehicles

Disp.	Eng. Code	Evap. Code	Model	Trans.	ETW	Axle	N/V

APPENDIX III

Determination of Acceptable Durability Test Schedule*

A manufacturer may determine mileage test intervals for durability-data vehicles subject to the conditions specified in 40 CFR 86.082-26. The following procedure shall be used to determine if the schedule is acceptable to the Executive Officer.

1. Select exhaust system mileage test points and maintenance mileage test points for proposed (prop) schedule.

2. Calculate the sums of the squares corrected to the mean of the system mileages at the proposed test points:

$$A_{prop} = [\Sigma(X_p^2) - (\Sigma X_p)^2/N_p]_{prop}$$

Where:

X = Individual mileages at which the vehicle will be tested.

N = Total number of tests (including before and after maintenance tests).

(Subscript "p" refers to proposed test schedule).

3. Determine exhaust system mileage test points and maintenance mileage test points based on testing at 5, 10, 15, 20, 25, 30, 35, 40, 45, and 50 thousand miles and maintenance mileage test points selected for the proposed schedule in Section 1. This schedule will be designated as the standard (std) test schedule.

4. Calculate the sums of squares corrected to the mean of the standard test schedule.

$$B_{std} = [\Sigma(X_s^2) - (\Sigma X_s)^2/N_s]_{std}$$

Where:

X = Individual mileages at which the vehicle will be tested.

N = Total number of tests (including before and after maintenance).

---

*For diesel-powered vehicles equipped with periodically regenerating trap oxidizer systems (or those with continuously regenerating trap oxidizer systems elected to be certified to the provisions of diesel-powered vehicles with periodically regenerating trap oxidizer systems), additional test schedule requirements for regeneration tests must be met as outlined in subparagraphs 6.a.2. and 6.b.3. in these procedures.

APPENDIX IV

Procedure for Determining An Acceptable Exhaust Regeneration Durability-Data Test Schedule for Diesel-Powered Vehicles, Equipped with Periodically Regenerating Traps Oxidizer Systems.

1. Select exhaust system mileage test points for proposed (prop) schedule.

2. Calculate the sums of the squares corrected to the mean of the system mileages at the proposed test points:

$$A_{prop} = [\Sigma(X_p^2) - (\Sigma X_p)^2/N_p]_{prop}$$

Where:

X = Individual mileages at which the vehicle will be tested.

N = Total number of regeneration emission tests.

(Subscript "p" refers to proposed test schedule).

3. The exhaust system mileage tests points at 5,000, 20,000, 35,000, and 50,000 miles will be designated as the standard (std) test schedule.

4. Calculate the sums of square corrected to the mean of the standard tests schedule.

$$B_{std} = [\Sigma(X_s^2) - (\Sigma X_s)^2/N_s]_{std}$$

Where:

X = Individual mileages at which the vehicle will be tested.

N = Total number of regeneration emission tests.

(Subscript "s" refers to standard test schedule)

5. Refer to Table I and determine ~~t_i~~ t_p at ~~(N^i-2)~~ (N_p-2) prop degrees of freedom and ~~t^j~~ t_s at ~~(N^j-2)~~ (N_s-2) std degrees of freedom.

$$\text{If } -\sqrt{-\Sigma(N_i'-)^2_{prop}} \geq \frac{t^i_{prop}}{t^j_{std}} \times \sqrt{-\Sigma(N_j^i-)^2_{std}}$$

$$\text{If } \sqrt{A_{prop}} \geq \frac{t_p}{t_s} \times \sqrt{B_{std}}$$

the proposed plan is acceptable.

Table I

Degrees of Freedom N-2	t 0.050
1	6.314
2	2.920
3	2.353
4	2.132
5	2.015
6	1.943
7	1.895
8	1.860
9	1.833
10	1.812
11	1.796
12	1.782
13	1.771
14	1.761
15	1.753

APPENDIX V

Pollutant Mass Emissions Calculation Procedure for Vehicles Equipped with Periodically Regenerating Trap Oxidizer Systems

These calculation procedures are based on the Federal CVS-1975 Test Procedure.

The reported test results shall be computed by use of the following formulas:

CO_{conc} = Carbon monoxide concentration of the dilute exhaust sample corrected for background, water vapor, and CO_2 extraction, in ppm.

CO_{dm} = Carbon monoxide concentration of the dilution air sample as measured, in ppm.

CO_d = Carbon monoxide concentration of the dilution air corrected for water vapor extraction, in ppm.

CO_e = Carbon monoxide concentrations of the dilute exhaust sample volume corrected for water vapor and carbon dioxide extraction, in ppm. The calculation assumes the carbon to hydrogen ratio of the fuel to be 1:3.802 for natural gas and 1:2.658 for LPG.

CO_{em} = Carbon monoxide concentration of the dilute exhaust sample as measured, in ppm.

CO_{mass} = Carbon monoxide emissions, in grams per test phase.

$CO_{2_{conc}}$ = Carbon dioxide concentration of the dilute exhaust sample corrected for background and water vapor, in percent.

CO_{2_e} = Carbon dioxide concentration of the dilute exhaust sample, in percent.

$CO_{2_{mass}}$ = Carbon dioxide emissions, in grams per test phase.

$Density_{CO}$ = Density of carbon monoxide is 32.97 g/ft^3 at 68°F and 760 mm. Hg pressure.

Density CO2 = Density of carbon dioxide is ~~51.85~~ 51.81 g/ft3 68° and 760 mm. Hg pressure.

$Density_{HC}$ = Density of hydrocarbons is 18.64 g/ft^3 for natural gas and 17.28 g/ft^3 for LPG assuming an average carbon to hydrogen ratio of 1:3.802 for natural gas and 1:2.658 for LPG, at 68°F and 760 mm Hg pressure.

$Density_{NO_2}$	=	Density of oxides of nitrogen is 54.16 g/ft^3 assuming they are in the form of nitrogen dioxide, at 68°F and 760 mm Hg pressure.
DF	=	Dilution Factor
H	=	Absolute humidity in grains of water per pound of dry air.
HC_{conc}	=	Hydrocarbon concentration for the dilute exhaust sample corrected for background, in ppm carbon equivalent, i.e., equivalent propane X 3.
HC_d	=	Hydrocarbon concentration of the dilution air as measured, in ppm carbon equivalent.
HC_e	=	Hydrocarbon concentration of the dilute exhaust sample, in ppm carbon equivalent.
HC_{mass}	=	Hydrocarbon emissions, in grams per test phase.
K_H	=	Humidity correction factor
N	=	Number of revolutions of the positive displacement pump during the test phase while samples are being collected.
NOx_{conc}	=	Oxides of nitrogen concentration of the dilute exhaust sample corrected for background, in ppm.
NO_d	=	Oxides of nitrogen concentration of the dilute air as measured, in ppm.
NOx_e	=	Oxides of nitrogen concentration of the dilute exhaust sample as measured, in ppm.
NOx_{mass}	=	Oxides of nitrogen emissions, in grams per test phase.
P_B	=	Barometric pressure, in mm. Hg.
P_d	=	Saturated vapor pressure, in mm. Hg at ambient dry bulb temp.
P_i	=	Pressure depression below atmospheric measured at the inlet to the positive displacement pump.

T_p = Average temperature of dilute exhaust entering positive displacement pump during test while samples are being collected, in degrees Rankine.

R_a = Relative humidity of the ambient air, in percent.

V_{mix} = Total dilute exhaust volume in cubic feet per test phase corrected to standard conditions (528°R and 760 mm. Hg)

Vo = Volume of gas pumped by the positive displacement pump, in cubic feet per revolution. This volume is dependent on the pressure differential across the positive displacement pump.

Y_{ct} = Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.

Y_{ht} = Mass emissions as calculated from the "transient" phase of the hot start test, in grams per test phase.

Y_s = Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams test phase.

Y_{wm} = Weighted mass emissions of each pollutant, i.e., HC, CO, or NOx, in grams per vehicle mile.

D_{ct} = The measured driving distance from the "transient" phase of the cold start test, in miles.

D_{ht} = The measured distance from the "transient" phase of the hot start test, in miles.

D_s = The measured driving distance from the "stabilized" phase of the cold start test, in miles.

For passenger cars, light duty trucks, and medium duty vehicles:

(a) The mass emissions of each pollutant in grams per mile is

~~Ywm = (0.43Yct + 0.57Yht + Ys)/7.5~~

$$Y_{wm} = 0.43\left((Y_{ct} + Y_s)/(D_{ct} + D_s)\right) + 0.57\left((Y_{ht} + Y_s)/(D_h + D_s)\right)$$

(b) The mass of each pollutant for each phase of both the cold start test and the hot start test is determined from the following:

(1) Hydrocarbon mass:

$$HC_{mass} = V_{mix} \times Density_{HC} \times (HC_{conc}/1{,}000{,}000)$$

(2) Oxides of nitrogen mass:

$$NOx_{mass} = V_{mix} \times Density_{NO_2} \times K_H \times (NOx_{conc}/1{,}000{,}000)$$

K_H = humidity correction factor

(3) Carbon monoxide mass:

$$CO_{mass} = V_{mix} \times Density_{CO} \times (CO_{conc}/1{,}000{,}000)$$

(4) Carbon dioxide mass:

$$CO_{2\ mass} = V_{mix} \times Density_{CO_2} \times (CO_{2\ conc}/100)$$

$$V_{mix} = \frac{V_o \times N \times (P_b - P_i) \times 528}{(760)\ (T_p)}$$

$$HC_{conc} = HC_e - HC_d\ (1-1/DF)$$

$$NOx_{conc} = NOx_e - NOx_d\ (1-1/DF)$$

$$CO_{conc} = CO_e - CO_d\ (1-1/DF)$$

$$CO_e = (1-0.02901\ CO_{2_e} - 0.000323\ R_a)\ CO_{em} \text{ for natural gas}$$

$$CO_e = (1-0.02328\ CO_{2_e} - 0.000323\ R_a)\ CO_{em} \text{ for LPG}$$

$$CO_d = (1-0.000323\ R_a)\ CO_{dm}$$

$$KH = \frac{1}{1-0.0047(H-75)}$$

$$H = \frac{(43.478R_a)\ (Pd)}{P_B - \frac{P_d \times R_a}{100}}$$

$$DF = \frac{9.77}{CO_{2_e} + (HC_e + CO_e) \times 10^{-4}} \quad \text{for natural gas}$$

$$DF = \frac{11.7}{CO_{2_e} + (HC_e + CO_e) \times 10^{-4}} \quad \text{for LPG}$$

Pollutant Mass Emissions Calculation Procedure for Vehicles Equipped with Periodically Regenerating Trap Oxidizer Systems

Exhaust Emissions

Amend subparagraph § 86.144-78(a) in Part 86, Title 40, Code of Federal Regulations (CFR) to read:

The final reported test results shall be computed by the use of the following formula:

(a) For light-duty vehicles and light-duty trucks:

$$Ywm = 0.43\ ((Yct + Ys)/(Dct + Ds)) + 0.57\ ((Yht + Ys)/(Dht + Ds))$$

For purposes of adjusting emissions for regeneration:

$$Re = ((Yr1 - Yct) + (Yr2 - Ys) + (Yr3 - Yht))/(Dct + Ds + Dht)$$

$$Yr = Ywm^{*} + Re$$

Where:

Ywm = Weighted mass emissions of each pollutant, i.e., HC, CO, NOx or CO_2, in grams per vehicle mile.

Yct = Mass emissions as calculated from the "transient" phase of the cold start test, in grams per test phase.

Yht = Mass emissions as calculated from the "transient" phase of the hot start test in grams per test phase.

Ys = Mass emissions as calculated from the "stabilized" phase of the cold start test, in grams per test phase.

Dct = The measured driving distance from the "transient" phase of the cold start test, in miles.

Dht = The measured distance from the "transient" phase of the hot start test, in miles.

Ds = The measured driving distance from the "stabilized" phase of the cold start test, in miles.

Yr = Regeneration emission test.

Re = Mass emissions of each pollutant attributable to regeneration in grams per mile.

---

* Ywm is derived using the emission data from a test with no regeneration.

Yr1 = Mass emissions, during a regeneration emission test, as calculated from the "transient" phase of the cold start test, in grams per test phase.

Yr2 = Mass emissions, during a regeneration emission test, as calculated from the "stabilized" phase of the cold start test, in grams per test phase.

Yr3 = Mass emissions, during a regeneration emission test, as calculated from the "transient" phase of the hot start test in grams per test phase.

Particulate Emissions

Amend subparagraph §86.145-82(a) in Part 86, Title 40, Code of Federal Regulations (CFR) to read:

(a) The final reported test results for the mass particulate (Mp) in grams/mile shall be computed as follows.

For purposes of adjusting emissions for regeneration:

$$Mp = 0.43(Mp1 + Mp2)/(Dct + Ds) + 0.57\ (Mp3 + Mp2/(Dht + Ds)$$

$$Re = ((Mpr1 - Mp1) + (Mpr2 - Mp2) + (Mpr3 - Mp3))/(Dct+Ds+Dht)$$

$$Mpr = Mp^{*} + Re$$

Where:

(1) Mp1 = Mass of particulate determined from the "transient" phase of the cold start test, in grams per test phase. (See §86.110-82(c)(1) for determination.)

(2) Mp2 = Mass of particulate determined from the "stabilized" phase of the cold start test, in grams per test phase. (See §86.110-82(c)(1) for determination.)

(3) Mp3 = Mass of particulate determined from the "transient" phase of the hot start test, in grams per test phase. (See §86.110-82(c)(1) for determination.)

(4) Dct = The measured driving distance from the "transient" phase of the cold start test, in miles.

(5) Ds = The measured driving distance from the "stabilized" phase of the cold start test, in miles.

---

* Mp is derived using the emission data from a test with no regeneration.

(6) Dht = The measured driving distance from the "transient" phase of the hot start test, in miles.

(7) Mpr = Regeneration emission test

(8) Re = Mass of particulate attributable to regeneration in grams/mile.

(9) Mpr1 = Mass of particulate determined, during a regeneration emission test, from the "transient" phase of the cold start test, in grams per test phase.
(See § 86.110-82(c)(1) for determination.)

(10) Mpr2 = Mass of particulate determined, during a regeneration emission test, from "stabilized" phase of the cold start test, in grams per test phase.
(See § 86.110-82(c)(1) for determination.)

(11) Mpr3 = Mass of particulate determined, during a regeneration emission test, from the "transient" phase of the hot start test, in grams per test phase.
(See § 86.110-82(c)(1) for determination.)

Fuel Economy Calculations for Gaseous Fuels
Based on the Cold Start CVS-1975
Federal Test Procedure

Assume the fuel meets HD-5 specifications (95% C_3H_8, 5% nC_4H_{10}, by volume)

1. Physical constants of Propane and Normal Butane

Component	Mol. Wt.	Sp. Gr.	Liquid Density lb/gal @ 60°F				Liquid Density of HD-5 lb/gal at 60°F
C_3H_8	44.094	0.508	4.235	x	(0.95)	=	4.0233
nC_4H_{10}	58.12	0.584	4.868	x	(0.05)	=	.2434
							4.2667

2. Density of the HD-5 fuel

(0.95 X 4.235) + (0.05 X 4.868) = 4.267 lb/gal @ 60°F

3. Molecular Weights

Specie	Mol. Wt.
C	12.01115
H	1.00797
O	15.9994
CO	28.01055
CO_2	44.00995
*$CH_{2.658}$	14.6903

*Average ratio of Hydrogen to carbon atoms in HD-5 fuel.

C_3H_8 $\quad \frac{8}{3} = 2.666 \times 0.95$ (% propane) $= 2.533$

nC_4H_{10} $\quad \frac{10}{4} = 2.5 \times 0.05$ (% Butane) $= \frac{.125}{2.658}$

4. Weight of Carbon in:

CO = wt. of CO x (12.01115/28.01055) = wt CO x (0.429)

CO_2 = wt of CO_2 x (12.01115/44.00995) = wt CO_2 x (0.273)

$CH_{2.658}$ = wt. of $CH_{2.658}$ x (12.01115/14.6903) = wt $CH_{2.658}$ x (0.818)

5. Wt. of Carbon per gallon of LPG

wt. of carbon = 4.2667 lbs/gal x 453.59 gms/lb x 0.818 = 1583 grams C/gal HD-5

6. Fuel economy:

$$\frac{\text{grams C/gal}}{\text{grams C in exhaust/mi}} = \text{miles/gal.}$$

$$\text{LPG} = \frac{1583 \text{ gms C/gal}}{(0.818(HC) + (0.429)(CO) + (0.273)\ (CO_2)}$$

HC = CVS HC in grams/mile
CO = CVS CO in grams/mile
CO_2 = CVS CO_2 in grams/mile

$$\text{For gasoline} = \frac{2423\ \ 2421}{(0.866)\ HC + (0.429)\ CO + (0.273)\ CO_2}$$

$$\text{For Natural Gas} = \frac{1535}{(0.759)\ HC + (0.429)\ CO + (0.273)\ CO_2}$$

APPENDIX VI

Blanket Approval of Running Changes and Field Fixes

Running changes and field fixes meeting the following definitions shall be granted automatic or "blanket" approval by the Executive Officer, provided that notification of changes listed in paragraph 1. below are received by the ARB at least five working days before implementation, and notification of changes listed in 2. through 13. below are received by the ARB within two working days after implementation. Such automatic approvals shall be effective when they are approved by EPA.

For passenger cars, light-duty trucks and medium-duty vehicles:

1. The addition of new models to an engine family where the new models differ from previously certified models only in model name and curb weight (same inertia weight class), and where the exhaust, evaporative and fill pipe emission control system specifications do not change.

2. Changes in axle ratio, tire size or tire type, providing that changes to the N/V ratio and/or load horsepower are within 5% of the originally certified values. This includes re-classification of base and optional axle ratios or tires.

3. The deletion of models or vehicle configurations.

4. Changes in fuel tank capacity of less than 10 percent of the originally certified capacity, providing there is no other modification of the evaporative emission control system.

5. Changes to the fuel filler system leaded fuel nozzle restrictor, where EPA preemption is involved.

6. Advance certification of models in the next higher inertia weight class, for use if needed later.

7. Changes in tailpipe length of less than ten inches.

8. The following changes involving spark plugs:

   a. The addition of resistor-type spark plugs if nonresistor spark plugs are standard, or vice-versa, providing the secondary circuit resistance changes less than 5 percent.

   b. The addition of alternate heat ranges within one range of the originally certified spark plugs.

   c. The change of spark plug gap within 15 percent of originally certified spark plug gap.

9. Changes to component part numbers when there are no changes in the materials used or to the performance specifications (e.g., distributor advance curves, carburetor flow curves, fuel pump supply pressure, etc.). These changes may be the result of parts consolidation, changes in supplier, addition/deletion of peripheral items such as brackets, and minor dimensional changes where the durability and performance are not affected.

10. Changes in the crankcase emission control system where EPA preemption is involved, excluding revisions that could have an interaction effect on exhaust emissions (e.g., PCV purge flow changes).

11. Changes submitted under the alternate or concurrent notification procedure in 40 CFR 86 which would otherwise qualify for automatic or "blanket" status.

12. Changes in the physical location of a vacuum hose connection with no change in the relationship between vacuum, speed, load or any other vacuum-related parameter, provided that the changes do not render the vacuum hose routing diagram unrepresentative.

13. Changes in exhaust system cross sectional area, if this area equals or exceeds the minimum area in the system.

ATTACHMENT E

This attachment contains the amendments proposed for adoption July 24, 1986 shown in conjunction with the amendments related to the 0.4 gram per mile (g/mi) oxides of nitrogen (NOx) standard which were approved by the Board April 25, 1986. The 0.4 g/mi NOx amendments are being distributed for a supplemental 15-day public availability period prior to adoption.

In this attachment, the regulations and test procedures as they are being amended by the 0.4 g/mi NOx action are treated as the existing provisions. Additions proposed for consideration at the July 24, 1986 public hearing are shown by underline, and deletions are shown by strikeout. This attachment is made up of four parts: E/A, E/B, E/C, and E/D. The parts correspond to the proposed amendments contained in Attachments A, B, C, and D, respectively. In parts E/C and E/D, only the portions of the test procedures affected by the 0.4 g/mi NOx amendments are shown; the remainder of the test procedures would be as proposed in Attachments C and D.

Part E/A, containing amendments to Title 13, California Administrative Code, Section 1960.1, shows appropriate amendments to Section 1960.1(e), which will be added by the 0.4 g/mi NOx action. The amendments to subsection (e) simply reflect amendments proposed to subsection (d), and would have no additional substantive effect. Part E/B, showing the amendments to Title 13, California Administrative Code, Section 1960.1.5, shows modifications to portions of Section 1960.1.5(a) which are being added in the 0.4 g/mi NOx action. New amendments are shown relating to a necessary changeover from references to Equivalent Inertia Weight (EIW) to references to Loaded Vehicle Weight (LVW), and associated changes to weight ranges shown in the regulation. These changes are nonsubstantive -- the EIW and LVW weight ranges have an identical effect.

ATTACHMENT E/A

PROPOSED

Amend Title 13, California Administrative Code, Section 1960.1, subsections (d), (e) and (h), to read as follows:

1960.1 Exhaust Emission Standards and Test Procedures--1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles.

(d)(1) The exhaust emissions from new 1984 through 1987 ~~1988~~ model passenger cars, light-duty trucks, and medium-duty vehicles ~~and new 1984 through 1990 model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer~~, subject to registration and sold and registered in this state, shall not exceed:

1984 THROUGH 1987 ~~1988~~ EXHAUST EMISSIONS STANDARDS(6)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.) (2)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC(5)	All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39 (0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV (5)	0-3999	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)	4000-5999	100,000	0.50 (0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).

(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

(5) This set of standards for 1984 through 1987 ~~1988~~ model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section ~~1960.15.~~ 1960.1.5.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year, and 0.2 g/mi for the 1986 ~~through 1988~~ and 1987 model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(2) The exhaust emissions from new 1988 model passenger cars, light-duty trucks, and medium-duty vehicles and new 1988 through 1990 model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:

1988 EXHAUST EMISSIONS STANDARDS(5)
(grams per mile)

Vehicle Type(1)	Loaded Vehicle Weight (lbs.)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons(2)		Carbon Monoxide	Oxides of Nitrogen (3)
PC	All	50,000	0.39	(0.41)	7.0	0.4
PC(4)	All	50,000	0.39	(0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39	(0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46		8.3	1.0
LDT,MDV	0-3750	50,000	0.39	(0.41)	9.0	0.4
LDT,MDV (4)	0-3750	50,000	0.39	(0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3750	100,000	0.39	(0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3750	100,000	0.46		10.6	1.0
LDT,MDV	3751-5750	50,000	0.50	(0.50)	9.0	1.0
LDT,MDV (Option 1)	3751-5750	100,000	0.50	(0.50)	9.0	1.5
MDV	5751 & larger	50,000	0.60	(0.60)	9.0	1.5
MDV (Option 1)	5751 & larger	100,000	0.60	(0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

(2) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(3) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

(4) This set of standards is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1950.1.5.

(5) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to a particulate exhaust emission standard of 0.2 g/mi for the 1988 model year. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(e) The exhaust emissions from new 1989 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, except those produced by a small volume manufacturer, and new 1991 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:

1989 AND SUBSEQUENT MODEL-YEAR EXHAUST EMISSIONS STANDARDS~~(6)~~(5)
(grams per mile)

Vehicle Type(1)	~~Equivalent Inertia Weight~~	Loaded Vehicle Weight (lbs.) ~~(2)~~	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons~~(3)~~(2)	Carbon Monoxide	Oxides of Nitrogen (3)(4)~~(5)~~
PC		All	50,000	0.39 (0.41)	7.0	0.4
PC~~(7)~~(6)		All	50,000	0.39 (0.41)	7.0	0.7
Diesel PC (Option 2)		All	100,000	0.46	8.3	1.0
LDT,MDV		0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV ~~(7)~~(6)		0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	0.7~~(8)~~(7)
Diesel LDT, MDV (Option 2)		0-~~3999~~ 3750	100,000	0.46	10.6	1.0
LDT,MDV		~~4000-5999~~ 3751-5750	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)		~~4000-5999~~ 3751-5750	100,000	0.50 (0.50)	9.0	1.5
MDV	5751	~~6000~~ & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	5751	~~6000~~ & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

~~(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).~~

(2)~~(3)~~Hydrocarbon standards in parentheses apply to total hydrocarbons.

(3)~~(4)~~The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

(4)~~(5)~~The standard for in-use compliance for passenger cars, light-duty trucks and medium-duty vehicles certifying to the 0.4 g/mi NOx standard shall be 0.55 g/mi NOx for 50,000 miles. If the in-use compliance level is above 0.4 g/mi NOx but does not exceed 0.55 g/mi NOx, and based on a review of information derived from a statistically valid and representative sample of vehicles, the Executive Officer determines that a substantial percentage of any class or category of such vehicles exhibits, prior to 50,000 miles or 5 years, whichever occurs first, an identifiable, systematic defect in a component listed in Section 1960.1.5(c)(2) which causes a significant increase in emissions above those exhibited by vehicles free of such defects and of the same class or category and having the same period of use and mileage, then the Executive Officer may invoke the enforcement authority under Sections 2112 and 2113, Title 13, California Administrative Code, to require remedial action by the vehicle manufacturer. Such remedial action shall be limited to owner notification and repair or replacement of the defective component. As used in this section, the term "defect" shall not include failures which are the result of abuse, neglect, or improper maintenance. This provision is applicable for the 1989 through 1993 model years only. For small volume manufacturers, this provision is applicable for the 1991 through 1995 model years only.

(5)~~(6)~~Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to a particulate exhaust emission standard of 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(6)~~(7)~~This set of standards is optional. A manufacturer may choose to certify to these standards pursuant to the conditions set forth in Section 1960.1.5.

(7)~~(8)~~Pursuant to Section 1960.1.5 (a)(1)(B), the optional standard for 1989 model year light-duty trucks and medium-duty vehicles only is 1.0 g/mi NOx.

(h) The test procedures for determining compliance with these standards are set forth in "California Exhaust Emission Standards and Test Procedures for 1981 ~~and Subsequent~~ through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles", adopted by the state board on November 23, 1976, as last amended ~~October 2, 1985~~ _____, and in "California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles", adopted by the state board on _____, 1986.

NOTE: Authority cited: Sections 39600, 39601, 43013, 43101, and 43104, Health and Safety Code, Reference: Sections 39002, 39003, 43000, 43013, 43100, 43101, 43101.5, 43102, 43104, 43106, and 43204, Health and Safety Code.

ATTACHMENT E/B

PROPOSED

Amend Title 13, California Administrative Code, Section 1960.1.5, subsections (a) and (b), to read as follows:*

1960.1.5 Optional NOx Standards for 1983 and Later Model Passenger Cars and Light-Duty Trucks and Medium-Duty Vehicles less than 4000 lbs. Equivalent Inertia Weight (EIW) or 3751 lbs. Loaded Vehicle Weight (LVW).

(a)(1) Notwithstanding any other provision of this chapter, a vehicle manufacturer may certify 1983 and later model vehicles to optional NOx standards as follows:

(A) Passenger cars - 0.7 gm/mile - 1983 through 1988 model years. LDT, MDV 0-3999 pounds EIW - 1.0 gm/mile - 1983 through ~~1988~~ 1987 model years. LDT, MDV 0-3750 lbs. LVW - 1.0 gm/mile - 1988 model year.

(B) For the 1989 model year, each manufacturer may certify no more than 50 percent of its projected California model-year sales of passenger cars, light-duty trucks (~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW), and medium-duty vehicles (~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW) to the optional NOx standard as follows:

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* Sections 1960.1.5(c) and (d) would remain in effect and would not be changed by the above proposal.

Passenger cars - 0.7 gm/mi

LDT, MDV ~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW - 1.0 gm/mi

(C) 1989 through 1993 model year passenger cars weighing more than ~~5000-pounds-EIW~~ 5250 lbs. LVW may be certified to the 0.7 gm/mile NOx standard.

(D) For the 1990 through 1993 model years, a vehicle manufacturer may certify passenger cars, light-duty trucks (~~0-3999-lbs.-EIW~~ 0-3750 lbs. LVW), and medium-duty vehicles (~~0-3999-lbs.-EIW~~ 0-3750 lbs. LVW) to the optional 0.7 gm/mi NOx standard subject to the following limitations:

For each model year, the total number of passenger cars (~~0-5000-pounds-EIW~~ 0-5250 lbs. LVW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of 10 percent of the total previous California model-year sales of these vehicles.

For each model year, the total number of light-duty trucks (~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW) and medium-duty vehicles (~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of 15 percent of the combined total previous California model-year sales of these vehicles.

For manufacturers certifying for the first time in California, "previous California model-year sales" shall mean projected California model-year sales.

(2) Notwithstanding any other provisions of this chapter, a small volume manufacturer may certify 1989 and later model vehicles to optional NOx standards as follows:

(A) Passenger cars - 0.7 gm/mile - 1989 and 1990 model years. LDT, MDV ~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW - 1.0 gm/mile - 1989 and 1990 model years.

(B) For the 1991 model year, each small volume manufacturer may certify no more than 50 percent of its projected California model-year sales of passenger cars, light-duty trucks (~~0-3999 pounds-EIW~~ 3750 lbs. LVW), and medium-duty vehicles (~~0-3999-pounds EIW~~ 3750 lbs. LVW) to the optional NOx standards as follows:

Passenger cars - 0.7 gm/mile

LDT, MDV ~~0-3999-pounds-EIW~~ 0-3750 lbs. LVW - 1.0 gm/mile

(C) For the 1992 through 1995 model years, each small volume manufacturer may certify passenger cars, light-duty trucks (~~0-3999 lbs.-EIW~~ 03750 lbs. LVW), and medium-duty vehicles (~~0-3999-lbs.-EIW~~ 3750 lbs. LVW) to the optional 0.7 gm/mi NOx standard subject to the following limitations:

For each model year, the total number of passenger cars (~~0-5000-pounds-EIW~~ 0-5250 lbs. LVW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of 10 percent of the total previous California model-year sales of these vehicles.

For each model year, the total number of light-duty trucks (~~0-3999-pounds-EIW~~ 3750 lbs. LVW) and medium-duty vehicles (~~0-3999-pounds-EIW~~ 3750 lbs. LVW) each manufacturer may certify at 0.7 gm/mi NOx shall be limited to a maximum of 15 percent of the combined total previous California model-year sales of these vehicles.

For manufacturers certifying for the first time in California, "previous California model-year sales" shall mean projected California model-year sales.

(b) Testing of vehicles certified under this section shall be conducted in accordance with the California Exhaust Emission Test Procedures applicable to either 1981 through 1987 or 1988 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles certified to the primary California Standards for 50,000 miles.

NOTE: Authority cited: Sections 39600, 39601, 43013, and 43101, Health and Safety Code Reference: Sections 39002, 39003, 43000(e), 43013, 43100, 43101, 43101.5, 43104, and 43106 Health and Safety Code.

ATTACHMENT E/C

Amend California Exhaust Emission Standards and Test Procedures for 1981 ~~and Subsequent~~ Through 1987 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, paragraph 4, subsections (d) and (e), to read as follows:

4.(d) The exhaust emissions from new 1984 through ~~1988~~ 1987 model passenger cars, light-duty trucks, and medium-duty vehicles ~~and new 1984 through 1990 model passenger cars, light duty trucks and medium duty vehicles produced by a small volume manufacturer~~, subject to registration and sold and registered in this state, shall not exceed:

1984 THROUGH ~~1988~~ 1987 EXHAUST EMISSION STANDARDS (6)(7)
(grams per mile)

Vehicle Type(1)	Equivalent Inertia Weight (lbs.)(2)	Durability Vehicle Basis (mi)	Non-Methane Hydro-carbons(3)	Carbon Monoxide	Oxides of Nitrogen (4)
PC	All	50,000	0.39(0.41)	7.0	0.4
PC (5)	All	50,000	0.39(0.41)	7.0	0.7
PC (Option 1)	All	100,000	0.39(0.41)	7.0	1.0
PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-3999	50,000	0.39(0.41)	9.0	0.4
LDT,MDV (5)	0-3999	50,000	0.39(0.41)	9.0	1.0
LDT,MDV (Option 1)	0-3999	100,000	0.39(0.41)	9.0	1.0
LDT,MDV (Option 2)	0-3999	100,000	0.46	10.6	1.0
LDT,MDV	4000-5999	50,000	0.50(0.50)	9.0	1.0
LDT,MDV (Option 1)	4000-5999	100,000	0.50(0.50)	9.0	1.5
MDV	6000 & larger	50,000	0.60(0.60)	9.0	1.5
MDV (Option 1)	6000 & larger	100,000	0.60(0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.
(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).
(3) Hydrocarbon standards in parentheses apply to total hydrocarbons.

(4) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty truck and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

(5) This set of standards for 1984 through ~~1988~~ 1987 model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section 1960.15.

(6) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: 0.4 g/mi for the 1985 model year and 0.2 g/mi for the 1986 ~~through~~ and ~~1988~~ 1987 model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

(7) For gaseous-fueled vehicles the calculation procedures provided in the appendix shall be used for determining emissions and fuel economy.

~~(e)--The exhaust emissions from new 1989 and subsequent model passenger cars, light duty trucks, and medium duty vehicles, except those produced by a small volume manufacturer, and new 1991 and subsequent model passenger cars, light duty trucks and medium duty vehicles produced by a small volume manufacturer, subject to registration and sold and registered in this state, shall not exceed:~~

~~1989 AND SUBSEQUENT MODEL YEAR EXHAUST EMISSION STANDARDS (6)(7)~~

~~(grams per mile)~~

~~Vehicle Type (1)~~	~~Equivalent Inertia Weight (lbs.) (2)~~	~~Durability Vehicle Basis (mi)~~	~~Non-Methane Hydrocarbons (3)~~	~~Carbon Monoxide~~	~~Oxides of Nitrogen (4)-(5)~~
~~PC~~	~~All~~	~~50,000~~	~~0.39 (0.41)~~	~~7.0~~	~~0.4~~
~~PC (8)~~	~~All~~	~~50,000~~	~~0.39 (0.41)~~	~~7.0~~	~~0.7~~
~~Diesel PC (Option 2)~~	~~All~~	~~100,000~~	~~0.46~~	~~8.3~~	~~1.0~~
~~LDT, MDV~~	~~0-3999~~	~~50,000~~	~~0.39 (0.41)~~	~~9.0~~	~~0.4~~
~~LDT, MDV (8)~~	~~0-3999~~	~~50,000~~	~~0.39 (0.41)~~	~~9.0~~	~~0.7 (9)~~
~~Diesel LDT, MDV (Option 2)~~	~~0-3999~~	~~100,000~~	~~0.46~~	~~10.6~~	~~1.0~~
~~LDT, MDV~~	~~4000-5999~~	~~50,000~~	~~0.50 (0.50)~~	~~9.0~~	~~1.0~~
~~LDT, MDV (Option 1)~~	~~4000-5999~~	~~100,000~~	~~0.50 (0.50)~~	~~9.0~~	~~1.5~~
~~MDV~~	~~6000 & larger~~	~~50,000~~	~~0.60 (0.60)~~	~~9.0~~	~~1.5~~
~~MDV (Option 1)~~	~~6000 & larger~~	~~100,000~~	~~0.60 (0.60)~~	~~9.0~~	~~2.0~~

(1) "PC"-means-passenger-cars.
"LDT"-means-light-duty-trucks.
"MDV"-means-medium-duty-vehicles.

(2) Equivalent-inertia-weights-are-determined-under-subparagraph-40-CFR-86.129-79(a).

(3) Hydrocarbon-standards-in-parentheses-apply-to-total-hydrocarbons.

(4) The-maximum-projected-emissions-of-oxides-of-nitrogen-measured-on-the federal-Highway-Fuel-Economy-Test-(HWFET;-40-CFR-Part-600,-Subpart-B) shall-be-not-greater-than-1.33-times-the-applicable-passenger-car standards-and-2.00-times-the-applicable-light-duty-truck-and medium-duty-vehicle-standards-shown-in-the-table.--Both-the-projected emissions-and-the-HWFET-standard-shall-be-rounded-to-the-nearest-0.1 before-gm/mi-being-compared.

(5) The-standard-for-in-use-compliance-for-passenger-cars,-light-duty trucks-and-medium-duty-vehicles-certifying-to-the-0.4-g/mi-NOx-standard shall-be-0.55-g/mi-NOx-for-50,000-miles.--If-the-in-use-compliance-level is-above-0.4-g/mi-NOx-but-does-not-exceed-0.55-g/mi-NOx,-and-based-on-a review-of-information-derived-from-a-statistically-valid-and representative-sample-of-vehicles,-the-Executive-Officer-determines that-a-substantial-percentage-of-any-class-or-category-of-such-vehicles exhibits,-prior-to-50,000-miles-or-5-years,-whichever-occurs-first, an-identifiable,-systematic-defect-in-a-component-listed-in Section-1960.1.5(c)(2)-which-causes-a-significant-increase-in-emissions above-those-exhibited-by-vehicles-free-of-such-defects-and-of-the-same class-or-category-and-having-the-same-period-of-use-and-mileage,-then the-Executive-Officer-may-invoke-the-enforcement-authority-under Sections-2112-and-2113,-Title-13,-California-Administrative-Code,-to require-remedial-action-by-the-vehicle-manufacturer.--Such-remedial-action shall-be-limited-to-owner-notification-and-repair-or-replacement-of-the defective-component.--As-used-in-this-section,-the-term-"defect"-shall-not include-failures-which-are-the-result-of-abuse,-neglect,-or-improper maintenance.--This-provision-is-applicable-for-the-1989-through-1993 model-years-only.--For-small-volume-manufacturers,-this-provision-is to-the-applicable-1991-through-1995-model-years-only.

(6) Diesel-powered-passenger-cars,-light-duty-trucks,-and-medium-duty vehicles-are-subject-to-a-particulate-exhaust-emission-standard-of 0.08-g/mi-for-the-1989-and-subsequent-model-years.--The-particulate compliance-shall-be-determined-on-a-50,000-mile-durability-vehicle-basis.

(7) For-gaseous-fueled-vehicles-the-calculation-procedures-provided-in the-appendix-shall-be-used-for-determining-emissions-and-fuel-economy.

(8) This-set-of-standards-is-optional.--A-manufacturer-may-choose-to certify-to-these-standards-pursuant-to-the-conditions-set-forth-in Section-1960.1.5.

(9) Pursuant-to-Section-1960.1.5(a)(1),-the-optional-standard-for-1989 model-year-light-duty-trucks-and-medium-duty-vehicles-only-is-1.0-gm/mi NOx.

ATTACHMENT E/D

Adopt California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles, Sections 3 and 10.c., as follows:

3. Standards

The following standards represent the maximum projected exhaust emissions for the useful life of the vehicle.

a. The exhaust emissions from new ~~1984 through~~ 1988 model passenger cars, light-duty trucks, and medium-duty vehicles ~~and new 1984 through 1990 model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer~~, subject to registration and sold and registered in this state, shall not exceed:

~~1984 THROUGH~~ 1988 EXHAUST EMISSIONS STANDARDS(5)(6)~~(7)~~
(grams per mile)

Vehicle Type(1)	~~Equivalent Inertia Weight (2)~~	Loaded Vehicle Weight (lbs.)	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons~~(3)~~(2)	Carbon Monoxide	Oxides of Nitrogen ~~(4)~~(3)
PC		All	50,000	0.39 (0.41)	7.0	0.4
PC~~(5)~~(4)		All	50,000	0.39 (0.41)	7.0	0.7
PC (Option 1)		All	100,000	0.39 (0.41)	7.0	1.0
PC (Option 2)		All	100,000	0.46	8.3	1.0
LDT,MDV		0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV ~~(5)~~(4)		0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 1)		0-~~3999~~ 3750	100,000	0.39 (0.41)	9.0	1.0
LDT,MDV (Option 2)		0-~~3999~~ 3750	100,000	0.46	10.6	1.0
LDT,MDV		~~4000-5999~~ 3751-5750	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)		~~4000-5999~~ 3751-5750	100,000	0.50 (0.50)	9.0	1.5
MDV	5751	~~6000~~ & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	5751	~~6000~~ & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

~~(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).~~

~~(3)~~(2) Hydrocarbon standards in parentheses apply to total hydrocarbons. In order to demonstrate compliance with a non-methane hydrocarbon emission standard, hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures".

~~(4)~~(3) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable passenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

~~(5)~~(4) This set of standards for ~~1984~~ 1988 and later model vehicles is optional. A manufacturer may choose to certify to these optional standards pursuant to the conditions set forth in Section ~~1960.15~~ 1960.1.5 of Title 13, California Administrative Code.

~~(6)~~(5) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to the following particulate exhaust emission standards: ~~0.4 g/mi for the 1985 model year,~~ 0.2 g/mi for the ~~1986 through~~ 1988 model years, and 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

~~(7)~~(6) For gaseous-fueled vehicles the calculation procedures provided in ~~the~~ Appendix V shall be used for determining emissions and fuel economy.

b. The exhaust emissions from new 1989 and subsequent model passenger cars, light-duty trucks, and medium-duty vehicles, and new 1991 and subsequent model passenger cars, light-duty trucks and medium-duty vehicles produced by a small volume manufacturer subject to registration and sold and registered in this state, shall not exceed:

1989 AND SUBSEQUENT MODEL YEAR EXHAUST EMISSIONS STANDARDS(5)(6)~~(7)~~
(grams per mile)

Vehicle Type(1)	~~Equivalent Inertia Weight~~ Loaded Vehicle Weight (lbs.)~~(2)~~	Durability Vehicle Basis (mi)	Non-Methane Hydrocarbons ~~(3)~~(2)	Carbon Monoxide	Oxides of Nitrogen (3)(4)~~(5)~~
PC	All	50,000	0.39 (0.41)	7.0	0.4
PC~~(8)~~(7)	All	50,000	0.39 (0.41)	7.0	0.7
Diesel PC (Option 2)	All	100,000	0.46	8.3	1.0
LDT,MDV	0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	0.4
LDT,MDV ~~(8)~~(7)	0-~~3999~~ 3750	50,000	0.39 (0.41)	9.0	0.7~~(8)~~(7)
Diesel LDT, MDV (Option 2)	0-~~3999~~ 3750	100,000	0.46	10.6	1.0
LDT,MDV	~~4000-5999~~ 3751-5750	50,000	0.50 (0.50)	9.0	1.0
LDT,MDV (Option 1)	~~4000-5999~~ 3751-5750	100,000	0.50 (0.50)	9.0	1.5
MDV	5751 ~~6000~~ & larger	50,000	0.60 (0.60)	9.0	1.5
MDV (Option 1)	5751 ~~6000~~ & larger	100,000	0.60 (0.60)	9.0	2.0

(1) "PC" means passenger cars.
"LDT" means light-duty trucks.
"MDV" means medium-duty vehicles.

~~(2) Equivalent inertia weights are determined under subparagraph 40 CFR 86.129-79(a).~~

~~(3)~~ (2) Hydrocarbon standards in parentheses apply to total hydrocarbons. In order to demonstrate compliance with a non-methane hydrocarbon emission standard, hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures".

~~(4)~~ (3) The maximum projected emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B) shall be not greater than 1.33 times the applicable assenger car standards and 2.00 times the applicable light-duty trucks and medium-duty vehicle standards shown in the table. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 gm/mi before being compared.

~~(5)~~ (4) The standard for in-use compliance for passenger cars, light-duty trucks and medium-duty vehicles certifying to the 0.4 g/mi NOx standard shall be 0.55 g/mi NOx for 50,000 miles. If the in-use compliance level is above 0.4 g/mi NOx but does not exceed 0.55 g/mi NOx, and based on a review of information derived from a statistically valid and representative sample of vehicles, the Executive Officer determines that a substantial percentage of any

class or category of such vehicles exhibits, prior to 50,000 miles or 5 years, whichever occurs first, an identifiable, systematic defect in a component listed in Section 1960.1.5(c)(2) of Title 13, California Administrative Code which causes a significant increase in emissions above those exhibited by vehicles free of such defects and of the same class or category and having the same period of use and mileage, then the Executive Officer may invoke the enforcement authority under Sections 2112 and 2113, Title 13, California Administrative Code, to require remedial action by the vehicle manufacturer. Such remedial action shall be limited to owner notification and repair or replacement of the defective component. As used in this section, the term "defect" shall not include failures which are the result of abuse, neglect, or improper maintenance. This provision is applicable for the 1989 through 1993 model years only. For small volume manufacturers, this provision is applicable for the 1991 through 1995 model years only.

~~(6)~~ (5) Diesel-powered passenger cars, light-duty trucks, and medium-duty vehicles are subject to a particulate exhaust emission standard of 0.08 g/mi for the 1989 and subsequent model years. The particulate compliance shall be determined on a 50,000 mile durability vehicle basis.

~~(7)~~ (6) For gaseous-fueled vehicles the calculation procedures provided in ~~the~~ Appendix V shall be used for determining emissions and fuel economy.

~~(8)~~ (7) This set of standards is optional. A manufacturer may choose to certify to these standards pursuant to the conditions set forth in Section 1960.1.5 of Title 13, California Administrative Code.

~~(9)~~ (8) Pursuant to Section 1960.1.5(a)(1)(B), Title 13, California Administrative Code, the optional standard for 1989 model year light-duty trucks and medium-duty vehicles only is 1.0 g/mi NOx.

* * * * *

10. Optional 100,000 Mile Certification Procedure

* * * * *

c. Maintenance

Only the following scheduled maintenance shall be allowed under subparagraph ~~86.078-25(a)(1)(i)~~ 86.085-25 (a)(1)(i).

1. 25(a)(1)(i) Option 1. For ~~1981~~ 1988 model gasoline or diesel-powered vehicles, and 1989 and later model gasoline or diesel-~~fueled~~ powered light-duty trucks and medium-duty vehicles 3751 L.V.W. and greater, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the follwing items at intervals no more frequent than indicated.

   (1) Drive belt tension on engine accessories (30,000 miles).
   (2) Valve lash (15,000 miles).
   (3) Spark plugs (30,000 miles).
   (4) Air filter (30,000 miles).

(5) Exhaust gas sensor (30,000 miles): Provided that~~,-for 1987-and-prior-model-years,-an-audible-and/or-visible signal-approved-by-the-Executive-Officer-alerts-the vehicle-operator-to-the-need-for-sensor-maintenance-at the-mileage-point;-and-provided-that-for-1988-and subsequent-model-year-vehicles;~~:

(a) the manufacturer shall equip the vehicle with a maintenance indicator consisting of a light or flag, which shall be preset to activate automatically by illuminating in the case of a light or by covering the odometer in the case of a flag the first time the minimum maintenance interval established during certification testing is reached and which shall remain activated until reset. After resetting, the maintenance indicator shall activate automatically when the minimum maintenance interval, when added to the vehicle mileage at the time of resetting, is again reached and shall again remain activated until reset. When the maintenance indicator consists of a light, it shall also activate automatically in the engine-run key position before engine cranking to indicate that it is functioning. The maintenance indicator shall be located on the instrument panel and shall, when activated, display the words "oxygen sensor" or may display such other words determined by the Executive Officer to be likely to cause the vehicle owner to seek oxygen sensor replacement. The maintenance indicator shall be separate from the malfunction indicator light required by Section 1968, Title 13, California Administrative Code;

(b) the manufacturer shall provide free replacement of the oxygen sensor, including both parts and labor, and shall reset the maintenance indicator without any charge, the first time the maintenance interval established during certification testing is reached for vehicles certified with scheduled sensor maintenance before 50,000 miles. If the oxygen sensor is replaced pursuant to the warranty provisions of Section 2037, Title 13, California Administrative Code, before the first maintenance interval is reached, the manufacturer shall also replace the oxygen sensor and reset the maintenance indicator at the mileage point determined by adding the maintenance interval to the vehicle's mileage at the time of the warranty replacement. If the calculated mileage point for a second oxygen sensor replacement would exceed 50,000 miles, no free second replacement shall be required;

(c) the maintenance indicator shall be resettable. The maintenance instructions required by paragraph 5.b. of these procedures shall provide instructions for the resetting of the maintenance indicator, and shall specify that the maintenance indicator shall be reset each time the oxygen sensor is replaced; and

(d) notwithstanding the provisions of Section 2037(c), Title 13, California Administrative Code, the oxygen sensor, including any replacement required pursuant to this section, shall be warranted for the useful life of the vehicle or engine. If such oxygen sensor fails during the useful life period, it shall be replaced by the manufacturer in accordance with Section 2037(d) Title 13, California Administrative Code.

(6) Choke, cleaning or lubrication only (30,000 miles).
(7) Idle speed (30,000 miles).
(8) Fuel Filter (30,000 miles).
(9) Injection timing (30,000 miles).

Option 2. For ~~1981~~ 1988 ~~and later~~ model gasoline powered vehicles or 1988 and later diesel-~~fueled~~ powered vehicles, maintenance shall be restricted to the inspection, replacement, cleaning, adjustment, and/or service of the following items at intevals no more frequent than indicated:

(1) Drive belt tension on engine accessories (30,000 miles).
(2) Valve lash (15,000 miles).
(3) Spark plugs (30,000 miles).
(4) Air filter (30,000 miles).
(5) Fuel filter (30,000 miles).
(6) Idle speed (30,000 miles).
(7) Injection timing (30,000 miles).

2. In addition, adjustment of the engine idle speed (curb idle and fast idle), valve lash, and engine bolt torque may be performed once during the first 5000 miles of scheduled driving, provided the manufacturer makes a satisfactory showing that the maintenance will be performed on vehicles in use.

d. The manufacturer shall agree to apply to vehicles certified under this paragraph the provision of Section 43204 of the California Health and Safety Code for a period of ten years or 100,000 miles, whichever first occurs.

State of California
AIR RESOURCES BOARD

Resolution 86-69

July 24, 1986

Agenda Item No.: 86-8-2

WHEREAS, on January 25, 1985, pursuant to Section 39662 of the Health and Safety Code, the Board identified benzene as a toxic air contaminant for which there is not sufficient available scientific evidence to support the identification of a threshold exposure level below which no significant adverse health effects are anticipated (see Title 17, California Administrative Code, Section 93000);

WHEREAS, following identification of benzene as a toxic air contaminant, the Board is required to consider the need for and appropriate degree of control of benzene;

WHEREAS, the staff prepared for the Board's review the "Proposed Benzene Control Plan" (the "Plan") which describes an overall course of action for control but does not propose for adoption any specific benzene control measures;

WHEREAS, the Plan contains potential nonvehicular benzene control measures identified by the staff and the districts working through the Technical Review Group and potential vehicular and fuel related benzene control measures identified by the staff;

WHEREAS, the Plan identifies potential benzene control measures that reflect the use of either presently available control technology or technology which is expected to be feasible in the near future;

WHEREAS, the Plan was made available to the public for review and comment;

WHEREAS, at a public meeting held June 19, 1986 the Board reviewed the Plan and considered the written comments and public testimony it received and directed the staff to provide more detailed and updated information which the Board may use in evaluating and selecting benzene control measures for further development;

WHEREAS, at the Board's direction, the staff prepared an "Addendum to Proposed Benzene Control Plan" which includes: revised motor vehicle emissions estimates; revised estimates of benzene emission trends; and rankings of potential benzene control measures by cost effectiveness, reduction in emissions and risk, time required for measure development, and a qualitative ranking;

WHEREAS, the Addendum to the Plan has been made available to the public for review and comment;

WHEREAS, at a public meeting held July 24, 1986, the Board reviewed the Addendum to the Plan and considered the written comments and public testimony it received;

WHEREAS, the Board finds that the Plan as supplemented by the Addendum to the Plan presents an appropriate overall course of action for the staff to follow in developing specific benzene control measures for the Board's consideration in order to reasonably reduce the public health risk from ambient benzene exposure.

NOW, THEREFORE, BE IT RESOLVED, the Board hereby directs the staff as follows:

1. To continue development as expeditiously as practicable of the motor vehicle hydrocarbon control measures identified as Group A in the Addendum;

2. To develop and bring before the Board as expeditiously as practicable the vehicular and motor vehicle fuel-related benzene-specific control measures set forth in Group B in the Addendum;

3. To work closely with the air pollution control districts through the Technical Review Group and with affected industry sources to further analyze and assess the nonvehicular control measures identified in Group C in the Addendum and bring before the Board those measures which warrant further consideration;

4. To study further the speculative measures set forth in Group D and develop and bring before the Board those which warrant further consideration; and

5. To provide progress reports to the Board no less frequently than on an annual basis.

I hereby certify that the above is a true and correct copy of Resolution 86-69, as adopted by the Air Resources Board.

Pat Hutchens for
Harold Holmes, Board Secretary

STATE OF CALIFORNIA
Air Resources Board

Resolution 86-70

July 24, 1986

Agenda Item No.: 86-8-3

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in the Kapiloff Acid Deposition Act (Stats. 1982, Ch 1473; Health and Safety Code Sections 39900-39915), the Legislature declared that acid deposition from anthropogenic sources in California may have significant adverse effects on the environment, on the economy and the public health and directed the Board to design and implement a comprehensive research and monitoring program with regard to acid deposition;

WHEREAS, Section 39910 of the Health and Safety Code authorizes the Board to require districts to impose additional permit and variance fees on nonvehicular sources within their jurisdictions to supplement funds which may be appropriated by the Legislature for acid deposition monitoring and research;

WHEREAS, acid deposition research and monitoring program objectives and priorities have been established and reported to the Governor and the Legislature in December 1983, December 1984 and December 1985 in accordance with the Kapiloff Acid Deposition Act;

WHEREAS, in approving the reports to the Governor and the Legislature, the Scientific Advisory Committee on Acid Deposition, appointed pursuant to Section 39905, specified that full implementation of the Board's research and monitoring program will require the maximum level of funding provided for under the Kapiloff Acid Deposition Act;

WHEREAS, the Board has adopted Resolution 85-62, dated July 25, 1985, the provisions of which are incorporated by reference herein, in which it approved a fee program for fiscal year 1985-86 and stated its intention to consider in 1986 the renewal and modification of the fee program;

WHEREAS, the Air Resources Board staff, in consultation with representatives of local air pollution control districts, has developed a proposed fee program for fiscal year 1986-87;

WHEREAS, in accordance with Health and Safety Code Section 39914, the proposed fee program has been designed to provide to the Air Pollution Control Fund net revenues in fiscal year 1986-87 in an amount which is the least of two million dollars ($2,000,000), or the amount based on the rate of twenty-five one

hundredths of one cent ($.0025) per pound of sulfur or nitrogen oxides emitted from major sources, or the amount appropriated from state funds for acid deposition research and monitoring by the Legislature;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

The funds to be collected pursuant to the proposed fee program are needed to implement the acid deposition research and monitoring program established pursuant to the Kapiloff Acid Deposition Act;

The proposed regulations are based on the most current data available for annual emissions of sulfur or nitrogen oxides from sources emitting 1,000 tons or more per year of either pollutant; and

The economic impact of the fee program on the affected sources of sulfur or nitrogen oxides will not be significant; and

WHEREAS, the Board has determined, pursuant to the requirements of the California Environmental Quality Act and Air Resources Board regulations, that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves Sections 90612-90615, Title 17, California Administrative Code, as set forth in Attachment A.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the regulations set forth in Attachment A after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as he deems appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to forward the adopted regulations when they have taken effect to the specified districts for appropriate action, and to the Department of Finance, the Legislative Analyst and the State Controller, for information and for appropriate action.

BE IT FURTHER RESOLVED that the Board gives notice of its intention to review the status of the acid deposition research and monitoring program in 1987, and to reconsider at that time the renewal and modification, as necessary, of the fee program in order to reflect changes in program needs and capabilities, base-year emissions, and such other factors as may influence acid deposition research and funding requirements.

I hereby certify that the above is a true and correct copy of Resolution 86-70, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider the Adoption of Sections 90612-90615, Title 17, California Administrative Code, Regarding the Acid Deposition Fee Program

Agenda Item No.: 86-8-3

Public Hearing Date: July 24, 1986

Response Date: August 25, 1986

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: Harold Holmes
Board Secretary

Date: September 26, 1986

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-68
86-70
86-71
86-94
86-98
86-99
86-115
87-9
87-61
87-62
87-66
88-1
88-8

State of California
AIR RESOURCES BOARD

Resolution 86-71

August 21, 1986

Agenda Item No.: 86-9-2

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to do such acts and to adopt such regulations as may be necessary for the proper execution of the powers and duties granted to, and imposed upon, the Board by law;

WHEREAS, Chapter 3.5 (commencing with Section 39650) of Part 2 of Division 26 of the Health and Safety Code establishes procedures for the identification of toxic air contaminants by the Board;

WHEREAS, Section 39655 of the Health and Safety Code defines a "toxic air contaminant" as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health;

WHEREAS, Section 39662 of the Health and Safety Code directs the Board to list, by regulation, substances determined to be toxic air contaminants, and to specify for each substance listed a threshold exposure level, if any, below which no significant adverse health effects are anticipated;

WHEREAS, chlorinated dioxins and dibenzofurans are emitted from a variety of combustion processes and have been measured in the emissions from sources similar to those now operating or proposed for construction in California;

WHEREAS, pursuant to the request of the Board, the Department of Health Services (DHS) evaluated the health effects of chlorinated dioxins and dibenzofurans in accordance with Section 39660 of the Health and Safety Code;

WHEREAS, DHS staff found that some chlorinated dioxins and dibenzofurans are proven animal carcinogens and concluded that dibenzo-p-dioxins and dibenzofurans chlorinated in the 2, 3, 7 and 8 positions and containing four, five, six or seven chlorine atoms (hereafter referred to as chlorinated dioxins and dibenzofurans) should be considered potential human carcinogens; chlorinated dioxins and dibenzofurans should be treated as substances without a carcinogenic threshold; health effects other than cancer are not expected to occur at predicted ambient levels; and the maximum excess lifetime cancer risk from exposure to these specific chlorinated dioxins and dibenzofurans are estimated to range from 0.6 to 38 cases per million people exposed per picogram per cubic meter;

WHEREAS, for the reasons set forth in its evaluation, DHS has concluded that, in the absence of strong positive evidence that carcinogenic substances act only through mechanisms which ought to have a threshold, these substances should be treated as acting without a threshold, and DHS has determined that insufficient evidence of a carcinogenic threshold exists at this time to allow the identification of a threshold exposure level with respect to chlorinated dioxins and dibenzofurans;

WHEREAS, upon receipt of the DHS evaluation, staff of the Board prepared a report including and in consideration of the DHS evaluation and recommendations and in the form required by Section 39661 of the Health and Safety Code and, in accordance with the provisions of that section, made the report available to the public and submitted it for review to the Scientific Review Panel (SRP) established pursuant to Section 39670 of the Health and Safety Code;

WHEREAS, in accordance with Section 39661 of the Health and Safety Code, the SRP reviewed the staff report, including the scientific procedures and methods used to support the data in the report, the data itself, and the conclusions and assessments on which the report was based, considered the public comments received regarding the report, and, on April 16, 1986 adopted for submittal to the Board, the following findings:

1. Chlorinated dioxins and dibenzofurans are potent toxins and are known carcinogens and/or promoters of carcinogenesis in animals.

2. Chlorinated dioxins and dibenzofurans, especially those chlorinated in the 2,3,7, and 8 positions and containing 4,5,6, or 7 chlorine atoms, are potential carcinogens or promoters of carcinogenesis in humans.

3. The current and planned waste-to-energy facilities in California will provide a high potential for emissions of chlorinated dioxins and dibenzofurans into air in the state.

4. An exposure level below which no significant health effects will occur cannot be identified.

WHEREAS, the SRP found the staff report to be without serious deficiency, and included in its findings the statement that the Panel agreed that chlorinated dioxins and dibenzofurans chlorinated in the 2, 3, 7 and 8 positions and containing four, five, six or seven chlorine atoms should be listed by the Air Resources Board as toxic air contaminants with no determined threshold below which adverse health effects will not occur;

WHEREAS, the staff has clarified that the purpose of this report is to assess the present and potential risk to public health posed by chlorinated dioxins and dibenzofurans for purposes of identifying these substances as toxic air contaminants under Section 39662 of the Health and Safety Code and is not

intended to serve as the basis for risk management decisions; a report containing an evaluation of the need and appropriate degree of regulation for these substances will be prepared by staff and considered in the future;

WHEREAS, new data relating to emissions of dioxins were presented which supplement the staff report and these data will be considered in the risk management phase of the process;

WHEREAS, the California Environmental Quality Act and Board regulations require that no activity having significant adverse environmental impacts be approved as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, in consideration of the staff report, including DHS' evaluation and recommendations, the available evidence, the findings of the SRP, and the written comments and public testimony it has received, the Board finds that:

Some chlorinated dioxins are proven animal carcinogens and concludes that chlorinated dioxins and dibenzofurans chlorinated in the 2, 3, 7 and 8 positions and containing four, five, six or seven chlorine atoms should be considered potential human carcinogens; and

There is not sufficient available scientific evidence at this time to support the identification of a threshold exposure level for these specific chlorinated dioxins and dibenzofurans; and

These specific chlorinated dioxins and dibenzofurans are air pollutants which, because of their carcinogenicity, may cause or contribute to an increase in mortality and an increase in serious illness, and pose a hazard to human health; and

Although some chlorinated dioxin and dibenzofuran emissions from waste-to-energy facilities were identified by the SRP and have been the subject of a large amount of public concern, the staff report has identified significant other sources of these pollutants now in operation and has recommended that all sources and potential sources be evaluated, and risk management recommendations should take into consideration the relative risk posed by different sources of these substances; and

Future recommendations on the management of risk due to emissions of chlorinated dioxins and dibenzofurans should reflect recent scientific developments in this area, because new information on these substances is continually becoming available; and

WHEREAS, the Board has determined, pursuant to the requirements of the California Environmental Quality Act and Board regulations, that this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board adopts the proposed regulatory amendments to Section 93000, Title 17, California Administrative Code, as set forth in Attachment A.

I hereby certify that the above is a true and correct copy of Resolution 86-71, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

Attachment A

Amend Title 17, California Administrative Code, Section 93000 to read as follows:

93000. Substances Identified As Toxic Air Contaminants. Each substance identified in this section has been determined by the state board to be a toxic air contaminant as defined in Health and Safety Code Section 39655. If the state board has found there to be a threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, that level is specified as the threshold determination. If the board has found there to be no threshold exposure level below which no significant adverse health effects are anticipated from exposure to the identified substance, determination of "no threshold" is specified. If the board has found that there is not sufficient available scientific evidence to support the identification of a threshold exposure level, the "Threshold" column specifies "None identified."

Substance	Threshold
Benzene (C_6H_6)	None identified
Ethylene Dibromide ($BrCH_2CH_2Br$; 1,2-dibromoethane)	None identified
Ethylene Dichloride ($ClCH_2CH_2Cl$; 1,2-dichloroethane)	None identified
Hexavalent Chromium*, Cr(VI)	None identified
Asbestos* [asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, (amosite), tremolite, actinolite, and anthophyllite]	None identified
Dibenzo-p-dioxins and Dibenzofurans chlorinated in the 2,3,7 and 8 positions and containing 4,5,6 or 7 chlorine atoms	None identified

NOTE: Authority cited: Sections 39600, 39601 and 39662, Health and Safety Code. Reference: Sections 39650, 39660, 39661 and 39662, Health and Safety Code.

*Note: Compounds identified by an asterisk have been identified as toxic air contaminants by the Air Resources Board but not yet approved by the Office of Administrative Law.

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider the Adoption of a Regulatory Amendment Identifying Chlorinated Dioxins and Dibenzofurans as Toxic Air Contaminants

Agenda Item No.: 86-9-2

Public Hearing Date: July 25, 1986

Response Date: July 25, 1986

Issuing Authority: Air Resources Board

Comments: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

CERTIFIED: Harold Holmes
Board Secretary

Date: January 12, 1989

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-68
86-70
86-71
86-94
86-98
86-99
86-115
87-9
87-61
87-62
87-66
88-1
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State of California
AIR RESOURCES BOARD

Resolution 86-72
August 21, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1435-128, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," has been submitted by Sierra Research, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1435-128, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," submitted by Sierra Research, Inc. for a total amount not to exceed $29,638.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1435-128, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," submitted by Sierra Research, Inc. for a total amount not to exceed $29,638.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $29,638.

I hereby certify that the above is a true and correct copy of Resolution 86-72 as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (1)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1435-128 entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California."

RECOMMENDATION: Adopt Resolution 86-72 approving Proposal No. 1435-128 for funding in an amount not to exceed $29,638.

SUMMARY: Approximately ten percent of the heavy-duty vehicles (HDVs) registered in the U.S. are based in California. HDVs encompass a broad range of weight categories and major use applications in both urban and rural areas of the state. Of primary interest to the ARB are: 1) the contribution of these HDV classes to emissions and air quality in urban areas, and 2) the contribution of trucks based outside the state to emission in California. The 1982 Truck Inventory and Use Survey (TIUS) data collected by the U. S. Bureau of the Census, together with other information and some data processing, can be used to address these concerns.

Data provided by this study would be used by the ARB staff to upgrade the State's emission inventory for HDVs and to assist in developing future emission standards and an inspection and maintenance program for HDV's.

The recommended contractor is Sierra Research, Inc. and the principal investigator would be Mr. Robert Dulla.

State of California
AIR RESOURCES BOARD

Resolution 86-73
August 21, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1436-128, entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles", has been submitted by the Radian Corporation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1436-128, entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles", submitted by the Radian Corporation for a total amount not to exceed $19,600.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1436-128, entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles", submitted by the Radian Corporation for a total amount not to exceed $19,600.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $19,600.

I hereby certify that the above is a true and correct copy of Resolution 86-73 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (2)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1436-128 entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles."

RECOMMENDATION: Adopt Resolution 86-73 approving Proposal No. 1436-128 augmenting funding for Contract A4-151-32 in an amount not to exceed $19,600 (original funding $99,798).

SUMMARY: The current program to develop inspection and maintenance procedures for diesel-powered heavy-duty vehicles is well underway. The contractor, Radian Corporation, has completed a preliminary estimate of the magnitude of the emissions from smoke emitting diesel vehicles and is currently involved in validating test procedures to relate emissions from these vehicles to poor maintenance practices and/or tampered emission controls. In order to establish a sound statistical basis for this relationship, the contractor has recommended a more extensive testing procedure than contemplated in the original contract. This procedure involves selecting ten vehicles with excessive smoke emissions and then measuring emissions of criteria pollutants from these vehicles (at random using the contractor developed smoke opacity test procedure) using a 14-mode dynamometer test procedure. The actual testing would be conducted by ARB staff at the Haagen-Smit Laboratory. The contractor would observe the testing and utilize the resulting data to relate excessive emissions to poor maintenance and/or tampered emission controls.

In addition, the contractor would obtain and analyze an unpublished data set collected by the New York City Department of Environmental Protection using transient chassis and smoke tests on more than 50 diesel buses. These data would provide the ARB with a more sound statistical basis for relating smoke emissions to vehicle defects.

Radian's participation in the dynamometer testing and analysis of NYCDEP's data, although closely related to the original contract and current effort, is beyond the scope of the original contract. Therefore, Radian has submitted a proposal for $19,600 to perform this added effort. The Research Screening Committee has reviewed the proposal and recommends funding the contract augmentation. Mr. Christopher Weaver would continue as the principal investigator for the study.

BUDGET SUMMARY

Radian Corporation

"Development of Inspection and Maintenance Procedures
for Diesel-Powered Heavy-Duty Vehicles"
Contract Number A4-151-32

BUDGET ITEMS:

Salaries	$5668		
Travel	2520		
Smokemeter Rental	300		
Supplies	259		
TOTAL, Direct Costs			$ 8,747
TOTAL, Indirect Costs			10,853
		AMENDED COST	$ 19,600

Original Project Cost	$ 99,798
Cost of this Amendment	19,600
Total Project Cost	$119,398

State of California
AIR RESOURCES BOARD

Resolution 86-74
August 21, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1433-128, entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or SO_2 on Trees: Valencia Oranges (Citrus sinensis)," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1433-128, entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or SO_2 on Trees: Valencia Oranges (Citrus sinensis)," submitted by the University of California, Riverside, for a total amount not to exceed $86,978.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1433-128, entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or SO_2 on Trees: Valencia Oranges (Citrus sinensis)," submitted by the University of California, Riverside, for a total amount not to exceed $86,978.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $86,978.

I hereby certify that the above is a true and correct copy of Resolution 86-74 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (3)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1433-128 entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or SO_2 on Trees: Valencia Oranges (Citrus sinensis)."

RECOMMENDATION: Adopt Resolution 86-74 approving Proposal No. 1433-128 for funding in an amount not to exceed $86,978.

SUMMARY: An ARB funded study to determine the effects of photochemical oxidants and sulfur dioxide on oranges was initiated in early 1983. A grove of forty-two two-year-old Valencia orange trees was planted at the Statewide Air Pollution Research Center, large clear plastic chambers were erected over the trees, and air pollutant exposures begun in May of 1984. The investigator harvested the first representative crop in June, 1986. The current proposal would continue the study for the period from October 1, 1986 to September 30, 1987, with the following experimental treatments: a) filtered air; b) filtered air plus sulfur dioxide at 0.09 ppm; c) fifty percent each ambient air and filtered air; d) ambient air; and 3) outside trees as a check against chamber effects. The investigator will measure tree growth, fruit yield and quality, and a numer of physiological variables to determine possible physiological bases for any growth and yield effects, and to identify physiological variables which would be most useful in assessing plant response to air pollutants under field conditions. The investigator will continue to monitor environmental conditions to determine if there are differences between chamber and outside environments which may affect plant response, and to provide a basis for comparisons of plant response to pollutants in different years and for extrapolating to other sites. The investigator will also perform several biochemical analyses to determine if changes in biochemistry are indicative of long-term plant response to air pollution exposure.

The lack of pollutant dose-yield response information for tree crops is a significant information gap with respect to ARB's efforts in assessment of crop losses caused by air pollution. This study will provide valuable information on the response of orange trees to oxidants and to sulfur dioxide, and it will help to determine if the year to year carryover of pollutant effects observed in grapes occurs in other perennial crop species. Understanding long term biochemical changes may provide a way to apply results to other tree crop species by determining how air pollution affects the same biochemical variables in those other species.

The contractor would be the University of California, Riverside and the principal investigator would be Dr. David Olszyk.

BUDGET SUMMARY

University of California, Riverside

"Chronic Physiological Growth,and Productivity Effects of Photochemical Oxidants or SO_2 on Trees: Valencia Oranges (Citrus sinensis)"

BUDGET ITEMS:

Salaries	$42,004	
Benefits	11,987	
Equipment	820	
Supplies	1,000	
Other Costs	21,771*	
Travel	1,563	
TOTAL, Direct Costs		$79,145
TOTAL, Indirect Costs		7,833
TOTAL PROJECT COST		$86,978

* Computer, Machine and Electronic Sharp Charges

Computer, Machine and Electronic Sharp Charges	$ 1,700
Computer Time - 10 hrs. @ $50/hr	500
Li-Cor Calibrations - 2 @ $125	250
Leaf Elemental Analysis - 132 Samples @ $6/ea	792
Electricity - 13,427 KW @ $.115/KW	18,529
	$21,771

State of California
AIR RESOURCES BOARD

Resolution 86-75
August 21, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1432-128, entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1432-128, entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use," submitted by the University of California, Riverside for a total amount not to exceed $30,797.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1432-128, entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use," submitted by the University of California, Riverside for a total amount not to exceed $30,797.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $30,797.

I hereby certify that the above is a true and correct copy of Resolution 86-75 as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (4)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1432-128 entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use."

RECOMMENDATION: Adopt Resolution 86-75 approving Proposal No. 1432-128 for funding in an amount not to exceed $30,797.

SUMMARY: For several years, the Air Resources Board has been concerned about air pollution damage to California's crops and its native plants. To foster research on the effects of air pollution on California vegetation ARB contracted with the University of California, Riverside, to build, operate, and maintain twenty open-top exposure chambers for plant study. Competent technical people are required to maintain and operate the chambers for the plant investigators who may not be familiar with the complex nature of experimental field exposure systems and air pollution meaurements.

Under the current proposal, routine maintenance procedures would cover both the twenty original open-top chambers, and twenty-eight tree exposure chambers now being used in an ARB funded study of the effects of air pollution on oranges. Combining the maintenance procedures for the two facilities under a single agreement is reasonable since maintenance of both facilities involves the same type of work. Procedures include: maintaining and repairing chambers built with ARB funds; ensuring proper operation and periodic calibration of pollutant dispensing, monitoring, and data collection equipment; performing necessary weed control and soil preparation; and providing instruction, supervision and day-to-day assistance to facility users.

The contractor would be the University of California, Riverside and the principal investigator would be Dr. David Olszyk.

State of California
AIR RESOURCES BOARD

Resolution 86-76

August 22, 1986

Agenda Item No.: 86-10-3

WHEREAS, Section 39602 of the Health and Safety Code designates the Air Resources Board (ARB or Board) as the air pollution control agency for all purposes set forth in federal law and designates the ARB as the state agency responsible for the preparation of the State Implementation Plan (SIP) required by the Clean Air Act;

WHEREAS, Sections 110 and 171 et seq. of the Clean Air Act as amended in 1977 mandate the revision of the SIP in designated nonattainment areas of the state in order to assure the attainment and maintenance of national ambient air quality standards by specified deadlines;

WHEREAS, pursuant to Clean Air Act Section 107, Kern County has been designated a nonattainment area for ozone, and therefore, the Kern County Air Pollution Control Board adopted a 1979 Plan for attainment of the national ambient air quality standard for ozone;

WHEREAS, the 1979 Plan projected attainment of the national ozone standard by the December 31, 1982, Clean Air Act deadline;

WHEREAS, the Kern County Air Pollution Control Board did not request an extension to December 31, 1987, to attain the ozone standard as provided in Section 172(a);

WHEREAS, the national ozone standard of 0.12 ppm averaged over 1 hour was not attained in Kern County by December 31, 1982;

WHEREAS, Clean Air Act Section 172(b)(2) requires the nonattainment area plan to provide for the implementation of all reasonably available control measures as expeditiously as practicable;

WHEREAS, Clean Air Act Section 172(b)(3) requires, in the interim until attainment, reasonable further progress (i.e., annual incremental reductions in emissions of ozone precursors), including such reduction in emissions from existing sources as may be obtained through the adoption, at a minimum, of reasonably available control technology;

WHEREAS, Clean Air Act Section 172(b)(4) requires the plan to contain a comprehensive, accurate, and current inventory of actual emissions from all sources;

WHEREAS, Clean Air Act Section 172(b)(8) requires the plan to contain emission limitations, schedules of compliance, and such other measures as necessary to meet Clean Air Act requirements;

WHEREAS, Clean Air Act Sections 172(b)(6) and 173 require the permit program in a nonattainment area to assure that by the time a major new or modified source commences operations, total emissions from that source and all other major and nonmajor sources in the area will be sufficiently less than total emissions from existing sources in the area so as to represent reasonable further progress by providing a net air quality benefit;

WHEREAS, Section 110 (a)(2)(h) of the Clean Air Act requires the Environmental Protection Agency (EPA) to call for a revision to the SIP when the EPA finds that a SIP is substantially inadequate to meet the ambient standards;

WHEREAS, on February 24, 1984, the EPA Administrator issued such a "SIP call";

WHEREAS, as provided by Clean Air Act Sections 110 and 172, the SIP call required Kern County to include in a revised plan an updated emission inventory; a refined modeling analysis demonstrating attainment of the ozone standard by December 31, 1987; adoption of additional and more stringent measures to reduce emissions of ozone precursors early in the SIP revision process; implementation of a vehicle inspection and maintenance program; and investigation of the need for the control of emissions of both oxides of nitrogen and reactive organic gases for ozone control;

WHEREAS, extensive cooperative discussions among the staffs of the ARB, the EPA, and Kern County led to the preparation of a draft 1986 Kern County Plan for consideration by the Kern County Board which met most of the above Clean Air Act requirements;

WHEREAS, the modeling in the draft Plan demonstrated that the control of both reactive organic gases and oxides of nitrogen will reduce ozone concentrations in Kern County;

WHEREAS, after a series of public hearings in January, February, and March of 1986 on the draft 1986 Kern County Plan, the Kern County Board did adopt the draft Plan on March 31, 1986, with major changes which considerably weakened it;

WHEREAS, these changes resulted in the following two major deficiencies in the adopted Plan: 1) it does not contain all reasonably available measures to reduce emissions of reactive organic gases and oxides of nitrogen, and 2) it does not revise the District's permit program to ensure a net reduction of ozone precursor emissions from the construction and operation of new and modified major sources;

WHEREAS, the Kern County Board submitted the 1986 Kern County Plan to the Air Resources Board on April 21, 1986, and requested that it be submitted to the EPA as part of California's State Implementation Plan;

WHEREAS, pursuant to Health and Safety Code Section 41650, the ARB must adopt the plan approved by the local air quality planning agency unless the Board finds that the plan will not meet the requirements of the Clean Air Act;

WHEREAS, if after a public hearing the Board finds the locally adopted plan to be inadequate, it may adopt such revisions as necessary to comply with Clean Air Act requirements;

WHEREAS, Clean Air Act Sections 110(a)(2)(I), 172(a), and 176 provide that failure to submit an adequate plan to the EPA may result in the imposition of sanctions and a construction ban for new major sources which could preclude any new industries from locating in Kern County;

WHEREAS, the EPA Region IX Administrator notified the Chairwoman of the Air Resources Board on June 27, 1986, that the Kern County Plan contains major deficiencies and that "EPA has begun drafting a Federal Register package that would propose the imposition of Clean Air Act sanctions in Kern County";

WHEREAS, state law, i.e., the California Environmental Quality Act, and ARB regulations require that no action which may have an adverse effect upon the environment be undertaken if feasible alternatives or mitigation measures are available which would substantially diminish such effect;

WHEREAS, on August 21 and 22, 1986, the Board held a noticed public hearing in accordance with the provisions and procedures set forth in Health and Safety Code Sections 41502, 41651, and 41652;

WHEREAS, the Board has considered the significant issues raised and written evidence presented by interested persons and board staff, and has addressed such issues in Attachment B to this resolution;

WHEREAS, based upon the information presented by the staff and the written and oral testimony received prior to and at the hearing, the Board finds:

1. Recent air quality monitoring data indicate exceedances of the national ozone standard in both central and western Kern County;

2. The 1986 Update to the Kern County Nonattainment Area Plan for Ozone and Carbon Monoxide ("the 1986 Kern County Plan") does not contain all reasonably available measures to control emissions of reactive organic gases and oxides of nitrogen emissions, both of which have been shown by air quality modeling analyses to be precursors for the formation of ozone in both western and central Kern County, as required by Clean Air Act Sections 172(b)(2) and (3);

3. The Kern County Plan does not demonstrate reasonable further progress by providing reductions in emissions of ozone precursors through the implementation of a permit program for major new and modified sources as required by Clean Air Act Section 173;

4. The emission inventory and forecasts in the Kern County Plan do not reflect recently available data for both western and central Kern County, and the Plan does not include emission forecasts beyond 1987, as required by Clean Air Act Sections 172(a), 172(b)(3), and 172(b)(4);

5. The 1986 Kern County Plan does not contain sufficient emission limitations, schedules of compliance, and such other measures as may be necessary to meet the requirements of Clean Air Act Section 172 in western and central Kern County;

6. The addition of specific commitments to the adopted 1986 Kern County Plan is therefore necessary to ensure that the Plan meets the requirements of the Clean Air Act set forth above;

7. The revision of the 1986 Kern County Plan will result in beneficial effects on air quality and the environment in Kern County;

8. The specific control measures proposed in the staff report are technologically feasible and cost-effective; and

9. The revisions to the permit program recommended by the staff are necessary to assure that such reductions are surplus, quantifiable, permanent and enforceable, and to ensure reasonable further progress in attaining the ozone standard pursuant to Clean Air Act Section 173.

NOW, THEREFORE BE IT RESOLVED, that the Board amends the 1986 Kern County Plan by adding a commitment that Kern County APCD Rule 425, Oxides of Nitrogen Emissions from Steam Generators Used in Thermally Enhanced Oil Recovery, will be considered for amendment at a public hearing by September 30, 1987, to 1) limit oxides of nitrogen emissions from (oil and gas-fired) steam generators in Kern County to 0.14 pound per million Btu of actual heat input; 2) eliminate Section C (banking provision) of the rule; 3) require that Section E of the rule be amended to (a) require that presently required compliance plans include enforceable, generator-specific emission limits and (b) specify criteria and procedures which must be followed before these limits may be changed; and 4) disallow the inclusion of nonoperating and unbuilt steam generators into the field-wide average emission calculations.

BE IT FURTHER RESOLVED, that the Board amends the 1986 Kern County Plan by adding a commitment that a public hearing will be held to consider the adoption by September 30, 1987, of a rule to control fugitive reactive organic gas emissions from light oil and gas production operations that is at least as effective as the rules adopted in the South Coast AQMD and the Ventura County APCD.

BE IT FURTHER RESOLVED, that the Board amends the 1986 Kern County Plan by adding a commitment that a public hearing will be held to consider the adoption by September 30, 1987, of a rule that is at least as effective as the South Coast AQMD's Rule 1110.1 to control oxides of nitrogen emissions in Kern County from gas-fired internal combustion engines.

BE IT FURTHER RESOLVED, that the Board amends the 1986 Kern County Plan by adding a commitment that a public hearing will be held to consider the adoption by September 30, 1987, of a rule to control fugitive emissions of reactive organic gases from natural gas processing plants that is at least as effective as the rules adopted by the South Coast AQMD and Ventura County APCD.

BE IT FURTHER RESOLVED, that the Board amends the 1986 Kern County Plan by adding a commitment that the District's Rule 210.1, Standards for an Authority to Construct Permit, Rule 210.3, Emission Reductions Banking, and Rule 201, Permits Required, will be considered for amendment at a public hearing by September 30, 1987, to ensure that emission reductions used to "offset" new emissions in both central and western Kern County are surplus, enforceable, permanent, and quantifiable.

BE IT FURTHER RESOLVED, that the Board amends the 1986 Kern County Plan to include an updated emission inventory as well as emission forecasts beyond 1987.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to revise the text of the 1986 Kern County Plan and the tables and figures included therein to make them conform with the foregoing, as well as to accomplish the following:

a. support the ARB modeling analysis and update the air quality discussion to reflect the 1985 data for both central and western Kern County;

b. explain the effect of California's heavy-duty vehicle standards in Kern County;

c. indicate that additional measures will be developed and considered for adoption in the future to reduce ozone precursor emissions in both central and western Kern County;

d. include a commitment to analyze new transportation control measures as part of the REEP; and

e. reflect the revised schedule for implementation of the San Joaquin Valley-wide air quality study.

BE IT FURTHER RESOLVED, that if the District Board does not make the appropriate amendments to fulfill the commitments set forth above regarding District rules and regulations by March 31, 1987, the Board will schedule a public hearing to consider doing so for the District by September 30, 1987.

BE IT FURTHER RESOLVED, that the rules to be adopted shall be phased in according to the schedules found in Attachment A to this resolution, which schedules represent implementation of such rules as expeditiously as practicable, as required by Clean Air Act Section 173(b)(2).

BE IT FURTHER RESOLVED, that the Board finds that the rule changes identified above for existing stationary sources represent Reasonably Available Control Technology as required by Clean Air Act Section 172(b)(3) and shall apply to sources in both central and western Kern County.

BE IT FURTHER RESOLVED, that a committee of the Board shall: 1) investigate the availability of less burdensome alternative measures which produce comparable emission reductions to the measures the Board has added to the plan to reduce NOx emissions from steam generators and stationary internal combustion engines; 2) review the question of whether NOx controls need to be implemented on the west side at this time in order to attain the ozone ambient air quality standard; and 3) report its findings regarding these matters to the full Board within 60 days.

BE IT FURTHER RESOLVED, that the Board directs the Executive Officer to forward the 1986 Kern County Plan, as amended by the Board August 22, 1986, to the EPA and to the Kern County Air Pollution Control Board and Air Pollution Control Officer in 60 days in order to meet the requirements of the Clean Air Act and avoid the imposition of sanctions and a construction ban in Kern County unless the Board determines, on the basis of the committee report, that revisions to the Plan as amended herein should be considered, in which case a duly noticed public hearing will be held to consider such revisions prior to sending the Kern County Plan to the EPA and to the District.

BE IT FURTHER RESOLVED, that the Board directs the staff to provide aid and assistance to the District in developing the new rules and regulations, and in amending existing rules and regulations, to conform to the commitments set forth above by the dates required.

NOTE: This version reflects the correction of a clerical error on Page 7, Paragraph 3, Line 8 where NO_2 was typed rather than ozone.

I hereby certify that the above is a true and correct copy of Resolution 86-76, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

Harold Holmes, Board Secretary

Attachment A

Compliance Schedules

1. All sources subject to the amendments to Rule 425, Oxides of Nitrogen Emissions from Steam Generators Used in Thermally Enhanced Oil Recovery, must be in compliance with the amended rule within one and one half years after adoption. Interim compliance schedules should be set forth in this rule.

2. Similar to the South Coast Air Quality Management District Rule 1110.1, compliance with the rule to control oxides of nitrogen emissions in Kern County from gas-fired internal combustion engines should be phased in according to the following schedule:

Rich-burn engines:

engines greater than 200 brake horsepower must comply by December 31, 1988.

engines greater than 50 brake horsepower but less than or equal to 200 brake horsepower must comply by December 31, 1995.

Lean-burn engines:

engines greater than 500 brake horsepower must comply by December 31, 1988.

engines greater than 50 brake horsepower but less than or equal to 500 brake horsepower must comply by December 31, 1995.

3. All sources subject to rule amendments to control fugitive reactive organic gas emissions from light oil and gas production operations must be in compliance with the amended rule within one year after rule adoption.

4. All sources subject to a rule to control fugitive emissions of reactive organic gases from natural gas processing plants must be in compliance within one year after rule adoption.

5. Rule amendments for the District's Rule 210.1, Standards for an Authority to Construct Permit; Rule 210.3, Emission Reductions Banking; and Rule 201, Permits Required, would be effective upon adoption.

ATTACHMENT B

RESPONSE TO SIGNIFICANT ISSUES

1. ISSUE:

THE KERN COUNTY APCD ADOPTED AMENDMENTS TO ITS NEW SOURCE REVIEW RULE ON AUGUST 27, 1984, WHICH CORRECTED ALL THE DEFICIENCIES LISTED BY THE ARB IN ITS REPORT.

KERN COUNTY APCD, WOGA AND OTHERS

RESPONSE:

THE 1984 RULE ADOPTED BY THE KERN COUNTY APCD DOES NOT ADDRESS ALL OF THE CONCERNS EXPRESSED IN THE STAFF REPORT. FIRST, WHILE IT IS TRUE THAT THE RULE REQUIRES THE USE OF ACTUAL EMISSIONS AS OFFSETS FOR HYDROCARBONS AND TOTAL SUSPENDED PARTICULATE MATTER, IT CONTINUES TO ALLOW THE USE OF PERMITTED EMISSIONS FOR OXIDES OF NITROGEN EQUIPMENT (RULE 210.4B). SECOND, THE 1984 RULE CONTINUES TO ALLOW UNLIMITED RENEWAL OF PERMITS. IN SOME CASES, THESE PERMITS WERE GRANTED BUT THE SOURCES ARE EITHER NOT CONSTRUCTED OR, IF CONSTRUCTED, NOT IN OPERATION.

2. ISSUE:

THE STAFF'S CRITICISMS OF RULE 425 ARE UNFOUNDED. THE STAFF HAS INACCURATELY DEPICTED THE BASIS AND INTENT OF THE RULE. RULE 425 WAS ADOPTED BY THE AIR RESOURCES BOARD AND WAS INTENDED TO PROVIDE FOR THE MAINTENANCE OF THE STANDARD. THE RULE SPECIFIES THAT REDUCTIONS ACHIEVED TO MEET THE STANDARD CAN BE BANKED, IT ALLOWS SOURCES TO COMPLY THROUGH FIELD-WIDE AVERAGING, AND IT REQUIRES A COMPLIANCE PLAN.

KERN COUNTY APCD, WOGA AND OTHERS

RESPONSE:

WHILE THE RULE WAS ADOPTED BY THE AIR RESOURCES BOARD, IT WAS DESIGNED TO MAINTAIN THE NO_2 STANDARD, NOT TO HELP ATTAIN THE OZONE STANDARD. ADDITIONALLY, IT HAS NOT BEEN IMPLEMENTED AS EXPECTED. FIRST, NON-OPERATING AND UNBUILT GENERATORS AS WELL AS GAS-FIRED GENERATORS ARE USED TO DETERMINE THE FIELD-WIDE AVERAGE. SECOND, ALTHOUGH COMPLIANCE PLANS ARE PREPARED

BY THE INDUSTRY, COMPLIANCE CANNOT BE DETERMINED BECAUSE SPECIFIC ENFORCEABLE EMISSION LIMITS HAVE NOT BEEN PLACED ON THE PERMITS. LASTLY, NEW INFORMATION IS AVAILABLE TO INDICATE THAT CONTROL OF NOX WILL BE REQUIRED TO REDUCE OZONE CONCENTRATIONS IN KERN COUNTY. THEREFORE, THE STAFF IS RECOMMENDING THAT THE BANKING PROVISIONS OF THE RULE BE ELIMINATED AS AN ADDITIONAL NOX CONTROL STRATEGY ON THE BASIS OF THIS NEW INFORMATION.

3. ISSUE:

THE CONTROL MEASURES PROPOSED BY THE STAFF FOR FUGITIVE EMISSIONS FROM OIL PRODUCTION AND NATURAL GAS PROCESSING PLANTS ARE NOT NEEDED IN WESTERN KERN COUNTY BECAUSE SUFFICIENT REACTIVE ORGANIC GAS EMISSIONS WILL ALREADY BE REDUCED FROM THIS AREA TO PROVIDE FOR ATTAINMENT AND MAINTENANCE OF THE OZONE STANDARD. FURTHERMORE, THE PROPOSED MEASURES ARE SPECIOUS FOR THE CENTRAL AREA BECAUSE THE ARB'S OWN STUDY SHOWS THAT THE FLOW OF HEAVY AND MEDIUM-WEIGHT CRUDE OIL THROUGH LEAKING VALVES AND STUFFING BOXES ON PRODUCT LINES ARE OF INSUFFICIENT MAGNITUDE TO CONTRIBUTE SIGNIFICANTLY TO OZONE FORMATION.

KERN COUNTY APCD AND OTHERS

RESPONSE:

THE PLAN DOES NOT DEMONSTRATE ATTAINMENT BY 1987 ON THE WEST SIDE; THEREFORE THE PLAN MUST INCLUDE ALL REASONABLY AVAILABLE CONTROL MEASURES. THESE MEASURES ARE BEING IMPLEMENTED IN OTHER AREAS OF CALIFORNIA AND THEREFORE MUST BE DEEMED REASONABLY AVAILABLE IN KERN COUNTY. THE STAFF'S PROPOSAL TO REDUCE FUGITIVE EMISSIONS FROM OIL PRODUCTION OPERATIONS APPLIES ONLY TO LIGHT OIL PRODUCTION, NOT TO HEAVY AND MEDIUM-WEIGHT CRUDE OIL PRODUCTION. REGULATIONS TO CONTROL FUGITIVE EMISSIONS FROM BOTH LIGHT OIL PRODUCTION AND NATURAL GAS PROCESSING PLANTS HAVE BEEN ADOPTED BY THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AND THE VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT. BASED ON THE EXPERIENCE OF THESE DISTRICTS THE REDUCTIONS RESULTING FROM THESE PROPOSALS WOULD BE APPROXIMATELY 50 PER CENT. THE ACTUAL REDUCTIONS THAT WOULD BE ACHIEVED IN THE CENTRAL AND WESTERN AREAS ARE SIGNIFICANT AND ARE SPECIFIED IN THE STAFF REPORT (PAGES 215, 216, 217). THE COST-EFFECTIVENESS IN TERMS OF THE COST PER POUND OF REACTIVE ORGANIC GAS EMISSIONS REDUCED ARE ALSO INCLUDED IN THE STAFF REPORT (PAGE 283).

4. ISSUE:

THE STAFF CLAIMS THAT STEAM GENERATORS WHICH WERE ISSUED PERMITS PRIOR TO SEPTEMBER 12, 1979, HAVE BEEN CREDITED WITH EMISSION REDUCTIONS UNDER RULE 425 (PERMITTED LEVELS) WHICH ARE IN EXCESS OF THEIR HISTORICAL EMISSION PROFILES. A REVIEW OF THE ADMINISTRATIVE RECORD CLEARLY REFUTES THE STAFF'S CLAIM. A LETTER WRITTEN BY A STAFF MEMBER INDICATES THAT THE EMISSION BASELINE WAS BASED ON "TEST RESULTS". THE STAFF IGNORES THE FACT THAT THOSE PERMITTED LEVELS REPRESENTED AVERAGE ACTUAL OPERATING LEVELS.

WOGA AND OTHERS

RESPONSE:

THE LETTER WRITTEN BY THE STAFF ONLY ADDRESSED THE BASELINE EMISSION DETERMINATION FOR STEAM GENERATORS AND DID NOT ADDRESS HOW THOSE BASELINE EMISSIONS WERE TO BE USED. THE STAFF'S CONCERN REGARDING IMPROPER BASELINE EMISSIONS RELATES TO THE PRACTICE OF THE DISTRICT IN ALLOWING THE USE OF PERMITTED LEVELS (WHICH DO NOT REFLECT ACTUAL OPERATING LEVELS) TO OFFSET EMISSIONS FROM NEW STEAM GENERATORS UNDER THE DISTRICT'S NEW SOURCE REVIEW RULE, NOT RULE 425. THE STAFF'S CONCERN WITH RULE 425 IS NOT THE USE OF THE BASELINE TO DETERMINE THE REDUCTIONS OBTAINED TO COMPLY WITH THE RULE BUT THE PRACTICE OF ALLOWING UNBUILT AND NON-OPERATING STEAM GENERATORS AS WELL AS GAS-FIRED GENERATORS TO COMPLY WITH THE RULE.

5. ISSUE:

THE NOX CONTROLS PROPOSED BY THE STAFF ARE NOT "REASONABLY AVAILABLE CONTROL MEASURES" WITHIN THE MEANING OF THE CLEAN AIR ACT. THE PROPOSAL TO LIMIT NOX EMISSIONS FROM ALL STEAM GENERATORS TO 0.14 LB/PER MILLION BTU HEAT INPUT IS NOT TECHNICALLY FEASIBLE. THE MEASURE PROPOSED BY THE STAFF TO REQUIRE THE INSTALLATION OF CATALYTIC CONVERTERS ON CERTAIN STATIONARY INTERNAL COMBUSTION ENGINES OF BOTH THE "RICH-BURN" AND "LEAN-BURN" VARIETY CONTAINS PROBLEMS AND IN THE CASE OF LEAN-BURN ENGINES REMAINS UNPROVEN.

WOGA, CHEVRON AND OTHERS

RESPONSE:

ALL NOX EMISSION CONTROL TECHNOLOGIES PROPOSED BY THE STAFF HAVE BEEN DEMONSTRATED. IN THE CASE OF OIL FIELD STEAM GENERATORS THESE TECHNOLOGIES, INCLUDING THE USE OF NATURAL GAS AS A FUEL, HAVE BEEN USED EXTENSIVELY. WOGA ACKNOWLEDGED THAT ROUGHLY 50% OF THE STEAM GENERATORS IN THE COUNTY ARE BEING OPERATED ON GAS. CONTROL EQUIPMENT IS ALSO IN USE ON OIL FIELD GENERATORS IN KERN COUNTY. THESE INSTALLATIONS SHOW THAT AN AVERAGE EMISSION LEVEL OF 0.14 LB PER MILLION BTU OF HEAT INPUT COULD BE ACHIEVED. THESE TECHNOLOGIES ARE BEING USED AT A COST-EFFECTIVENESS COMPARABLE TO THE COSTS OF CONTROLS REQUIRED BY OTHER LOCAL DISTRICT RULES. IN THE CASE OF STATIONARY INTERNAL COMBUSTION ENGINES, CATALYST CONTROLS HAVE BEEN DEMONSTRATED IN THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT'S DEMONSTRATION PROGRAM. BASED ON THE RESULTS OF THE DEMONSTRATION PROGRAM THE SCAQMD DETERMINED THAT CATALYST CONTROLS REPRESENTED RACT FOR STATIONARY ENGINES AND HAS ADOPTED A RULE THAT WOULD REQUIRE THEIR USE. FOR THE ABOVE REASONS THE ARB STAFF BELIEVES THAT THE PROPOSED CONTROL MEASURES REPRESENT RACT.

6. ISSUE:

REVISING RULES 210.1 AND 425 WILL RESTRICT AN OIL PRODUCTION COMPANY'S ABILITY TO EXPAND BECAUSE THE REVISIONS WOULD RESTRICT THE AVAILABILITY OF OFFSETS TO MITIGATE NEW PROJECTS.

DON GALLAHER AND OTHERS

RESPONSE:

THE ARB STAFF'S PROPOSAL IS THAT A COMMITMENT BE INCLUDED IN THE PLAN FOR THE DISTRICT TO REVISE RULE 210.1 TO REQUIRE THE USE OF ACTUAL EMISSIONS WHEN DETERMINING AVAILABLE OFFSETS AND TO REVISE RULE 425 TO REQUIRE A 0.14 LB/PER MILLION BTU LEVEL OF EMISSIONS. THE STAFF PROPOSES IN ITS REPORT THAT EMISSION REDUCTIONS BE BASED ON ACTUAL REDUCTIONS AND BE ENFORCEABLE. THIS IS THE POLICY IN OTHER AREAS OF CALIFORNIA AND OFFSETS HAVE BEEN AVAILABLE FOR NEW AND MODIFIED SOURCES IN OTHER AREAS. REVIEW OF THE EMISSIONS INVENTORY SHOWS THAT THERE ARE POTENTIAL SOURCES OF REDUCTIONS FOR USE AS OFFSETS IN KERN COUNTY AS WELL.

7. ISSUE:

RULE CHANGES COULD ELIMINATE SOURCES OF OFFSETS, THEREBY PREVENTING NEW SOURCES FROM LOCATING IN KERN COUNTY. THE ECONOMIC VITALITY OF KERN COUNTY SHOULD BE GIVEN A HIGH PRIORITY.

KERN COUNTY SUPERVISOR TRICE HARVEY, KERN COUNTY APCD, KERN COUNTY BOARD OF TRADE, BUILDING INDUSTRY ASSOCIATION OF KERN COUNTY, GREATER BAKERSFIELD CHAMBER OF COMMERCE, FRITO-LAY AND OTHERS

RESPONSE:

FEDERAL LAW REQUIRES ALL AREAS OF CALIFORNIA TO WORK TOWARD ATTAINMENT OF NATIONAL AMBIENT AIR QUALITY STANDARDS. KERN COUNTY IS CURRENTLY IN VIOLATION OF THE HEALTH-BASED NAAQS FOR OZONE AND WILL NOT ATTAIN THE STANDARD BY THE 1987 DEADLINE. THE IMPOSITION OF MONETARY SANCTIONS AND A CONSTRUCTION BAN FOR FAILURE TO MEET CLEAN AIR ACT REQUIREMENTS WOULD IMPAIR THE ECONOMIC VITALITY OF KERN COUNTY. THE PLAN REVISIONS ADOPTED BY THE ARB CONSTITUTE THE MOST COST-EFFECTIVE APPROACH THAT IS KNOWN TO THE ARB AT THIS TIME TO ACHIEVE A SIGNIFICANT AIR QUALITY IMPROVEMENT.

IT IS THE ARB'S POLICY TO CONSIDER NEW INFORMATION THAT MAY BECOME AVAILABLE TO REDUCE THE COST AND/OR INCREASE THE COST EFFECTIVENESS OF EMISSION CONTROL REGULATIONS THAT MAY BE ADOPTED IN THE FUTURE. ULTIMATELY, THE COSTS AND EFFECTS OF ANY SUCH FUTURE REGULATIONS WILL BE CONSIDERED BY THE BOARD OF THE KERN COUNTY AIR POLLUTION CONTROL DISTRICT AND, AS APPROPRIATE, BY THE ARB.

8. ISSUE:

NEW CONTROLS SHOULD BE DEFERRED UNTIL THE VALLEYWIDE STUDY IS DONE.

KERN COUNTY APCD, BERRY PETROLEUM, CHEVRON, KERN COUNTY FARM BUREAU AND OTHERS

RESPONSE:

AS DESCRIBED IN THE STAFF REPORT, THE STAFF BELIEVES THAT SUFFICIENT INFORMATION IS AVAILABLE TO MAKE BASIC CONTROL STRATEGY DECISIONS FOR KERN COUNTY NOW. THE VALLEYWIDE STUDY, IF ADEQUATE FUNDS ARE SECURED, WILL TAKE YEARS TO COMPLETE AND MAY OR MAY NOT RESULT IN MORE CONCLUSIVE INFORMATION ABOUT KERN COUNTY CONTROL NEEDS. THE EPA HAS TESTIFIED THAT IT WILL IMPOSE ECONOMIC SANCTIONS AND A CONSTRUCTION BAN IN KERN COUNTY IF AN APPROVABLE PLAN IS NOT SUBMITTED AT THIS TIME.

IN ORDER TO PROTECT THE PUBLIC HEALTH AND AVOID SANCTIONS, THE REQUIREMENTS OF THE CAA, I.E., IMPLEMENTATION OF RACMS AS EXPEDITIOUSLY AS PRACTICABLE AND DEMONSTRATION OF REASONABLE FURTHER PROGRESS IN THE INTERIM TO ATTAINMENT, MUST BE MET. COMPLIANCE WITH THESE REQUIREMENTS IS OVERDUE, AND CANNOT WAIT SEVERAL YEARS FOR THE COMPLETION OF A STUDY (SEE BETHLEHEM STEEL CORPORATION VS. EPA (7TH CIR. 1986) 782 F.2D 645, AT 651).

9. ISSUE:

EPA DOES NOT REQUIRE NOX CONTROLS AS AN OZONE STRATEGY.

KERN COUNTY APCD AND OTHERS

RESPONSE:

EPA HAS STATED THAT NOX IS AN OZONE PRECURSOR IN KERN COUNTY AS IDENTIFIED IN THE MODELING ANALYSIS PERFORMED FOR THE PLAN UPDATE, AND THAT THE PLAN THEREFORE NEEDS TO INCLUDE CONTROLS FOR NOX. A JUNE 27, 1986 LETTER FROM JUDITH AYRES, REGIONAL ADMINISTRATOR FOR EPA, TO JANANNE SHARPLESS, CHAIRWOMAN OF THE AIR RESOURCES BOARD, DISCUSSES THE NEED FOR NOX CONTROLS, AND CONCLUDES THAT "THE PLAN DOES NOT MEET BASIC PLANNING REQUIREMENTS OF THE CLEAN AIR ACT AND THE CRITERIA FOR POST-1987 SIPS."

10. ISSUE:

THE PLAN ADOPTED BY THE KERN COUNTY APCD DEMONSTRATES RFP AND SATISFIES THE INTENT AND OBJECTIVES OF THE NONATTAINMENT AREA PLANNING REQUIREMENTS AND SHOULD THEREFORE BE SUBMITTED TO EPA WITHOUT MODIFICATION.

KERN COUNTY, FRITO-LAY AND OTHERS

RESPONSE:

AS INDICATED THROUGHOUT THE STAFF REPORT, THE ARB STAFF BELIEVES THE PLAN DOES NOT COMPLY WITH THE CAA REQUIREMENTS BECAUSE 1) IT DOES NOT CONTAIN ALL REASONABLY AVAILABLE MEASURES TO REDUCE EMISSIONS OF REACTIVE ORGANIC GASES AND OXIDES OF NITROGEN, THE PRECURSORS FOR THE FORMATION OF OZONE, AS REQUIRED BY SECTION 172 OF THE CLEAN AIR ACT; AND 2) THE PLAN DOES NOT FULFILL THE REQUIREMENTS OF SECTION 173 OF THE ACT IN THAT THE DISTRICT'S RULES FOR ITS PERMIT PROGRAM ALLOW EMISSION INCREASES DUE TO NEW AND MODIFIED SOURCES TO INTERFERE WITH REASONABLE FURTHER PROGRESS TOWARDS ATTAINMENT OF THE NAAQS FOR OZONE. EPA STAFF, IN ITS TESTIMONY, ALSO STATED THE PLAN WAS NOT IN COMPLIANCE WITH CAA REQUIREMENTS. THEREFORE, SUBMITTING THE PLAN AS ADOPTED BY THE KERN COUNTY BOARD, WOULD RESULT IN DISAPPROVAL OF THE PLAN BY EPA. THE STAFF REPORT DISCUSSES THIS ISSUE IN DETAIL.

11. ISSUE:

RECENT FUEL USE DATA SHOW A 28.5% REDUCTION IN NOX EMISSIONS IN THE CENTRAL KERN AREA; HOWEVER, LITTLE OR NO BENEFIT IS SEEN IN OZONE LEVELS.

KERN COUNTY APCD AND OTHERS

RESPONSE:

THE EMISSIONS REDUCTIONS DATA ATTRIBUTED TO REDUCTIONS IN FUEL USE ACCOUNT FOR ONLY ABOUT ONE-THIRD OF THE TOTAL NOX EMISSIONS IN THE CENTRAL KERN AREA IN 1984. IF ALL SOURCES ARE CONSIDERED, THE REDUCTION IN NOX EMISSIONS IN THE CENTRAL AREA IS LESS THAN 10 PER CENT, NOT A 28.5% REDUCTION. A SMALL

CHANGE IN EMISSIONS IS EXTREMELY DIFFICULT TO CORRELATE WITH CHANGES IN MEASURED OZONE LEVELS BECAUSE OZONE LEVELS ALSO VARY DUE TO FLUCTUATIONS IN METEOROLOGICAL CONDITIONS. NO DATA WERE PRESENTED AT THE HEARING WHICH DEMONSTRATED THAT FLUCTUATIONS IN OZONE LEVELS WERE DUE TO THE CHANGES IN NOX EMISSIONS DESCRIBED, RATHER THAN TO OTHER FACTORS SUCH AS METEOROLOGY.

12. ISSUE:

ARB STAFF AGREED WITH THE INVENTORY DATA IN THE DRAFT PLAN AND NOW WANTS TO UPDATE DATA IN THE FINAL PLAN. THIS IS INCONSISTENT WITH PRIOR COMMITMENTS.

KERN COUNTY APCD AND OTHERS

RESPONSE:

THE DISTRICT CHANGED THE EMISSIONS DATA IN THE FINAL PLAN SO THAT IT NO LONGER MATCHED THE DRAFT PLAN DATA AGREED TO BY THE DISTRICT STAFF, ARB STAFF, AND INDUSTRY. THE ARB STAFF'S PROPOSED REVISIONS TO THE INVENTORY INCLUDE INCORPORATION OF ACTUAL FUEL USE DATA FOR 1984 SIMILAR TO THAT USED IN THE DISTRICT'S FINAL PLAN. THE DISTRICT'S PLAN, HOWEVER, DID NOT MAINTAIN CONSISTENCY WITH THE JOINT ARB, DISTRICT AND INDUSTRY AGREED-UPON INVENTORY METHODS AND SURVEY RESULTS USED IN THE DRAFT PLAN. THE ARB'S INVENTORY CHANGES FOR 1982 AND 1984 MERELY CORRECTED ERRORS AND OMISSIONS TO MAKE THE INVENTORY CONSISTENT WITH PREVIOUS AGREEMENTS WITH THE DISTRICT AND INDUSTRY.

13. ISSUE:

ARB'S EMISSION PROJECTIONS FOR 1995 ARE TOO HIGH, ARE NOT CONSISTENT WITH THE CURRENT DATA, AND AREN'T NEEDED.

KERN COUNTY APCD, WOGA AND OTHERS

RESPONSE:

EMISSION ESTIMATES FOR 1995 ARE INCLUDED TO SATISFY A DEFICIENCY IN THE FINAL PLAN IDENTIFIED BY THE ENVIRONMENTAL PROTECTION AGENCY. SECTION 172(B)(3) OF THE CLEAN AIR ACT REQUIRES THE PLAN TO DEMONSTRATE REASONABLE FURTHER PROGRESS IN THE INTERIM UNTIL ATTAINMENT. IN ORDER TO PLOT ANY PROGRESS WHICH MAY RESULT FROM IMPLEMENTATION OF CONTROL MEASURES, PROJECTIONS THROUGH 1995 ARE NECESSARY. THERE IS ALWAYS SOME UNCERTAINTY IN PROJECTING FUTURE EMISSIONS. NO INFORMATION WAS PRESENTED ON ALTERNATIVE EMISSION FORECASTS. ARB'S GROWTH PROJECTIONS HAVE BEEN SCALED BACK BECAUSE OF THE CURRENT DOWNTURN IN OIL PRODUCTION AND KERN'S PRESENT DEPRESSED ECONOMIC SITUATION. CURRENT ASSUMPTIONS OF GROWTH RANGE FROM ZERO TO THREE PER CENT ANNUALLY DEPENDING ON SOURCE CATEGORY AND LOCATION, AND ARE DOCUMENTED ON PAGES 3 AND 4 OF THE TECHNICAL SUPPORT DOCUMENT (PAGES 212-213 OF THE STAFF REPORT).

14. ISSUE:

CONTROL OF NOX EMISSIONS MAY NOT REDUCE OZONE CONCENTRATIONS AND COULD RESULT IN HIGH OZONE CONCENTRATIONS IN THE URBAN POPULATION CENTERS OF KERN COUNTY.

KERN COUNTY APCD, WOGA, FRITO-LAY, CHEVRON, SHELL CALIFORNIA AND OTHERS

RESPONSE:

THE RESULTS OF ARB'S ONE DAY SIMULATIONS FOR THE PROPOSED 1987 HYDROCARBON AND NOX CONTROL STRATEGIES SHOW OZONE BENEFITS IN THE BAKERSFIELD URBAN AREA EXCEPT FOR A SMALL AREA OF DISBENEFIT IN THE OILDALE SOURCE COMPLEX AREA. SEE PAGES 24 THROUGH 32 OF THE STAFF REPORT FOR FURTHER DISCUSSION OF THIS ISSUE.

15. ISSUE:

ADDITIONAL CONTROLS ARE NOT NECESSARY TO ATTAIN THE OZONE STANDARD ON THE WEST SIDE. COMPLETE ELIMINATION OF STATIONARY SOURCES IN THE CENTRAL AREA WILL NOT RESULT IN ATTAINMENT. THE WEST AND CENTRAL PORTIONS OF THE COUNTY SHOULD BE TREATED SEPARATELY FOR DEVELOPING CONTROL STRATEGIES.

KERN COUNTY APCD, WOGA, FRITO-LAY, CHEVRON, SHELL CALIFORNIA AND OTHERS

RESPONSE:

AIR QUALITY DATA FROM 1985, WHICH WAS NOT AVAILABLE WHEN KERN COUNTY PREPARED ITS PLAN, INDICATES AN INCREASE OF OZONE CONCENTRATIONS AND THE NUMBER OF EXCEEDANCES OF THE HEALTH-BASED OZONE STANDARD. UNLESS ATTAINMENT CAN BE DEMONSTATED BY 1987, ADDITIONAL EMISSION REDUCTIONS ARE NEEDED TO PROVIDE FOR REASONABLE FURTHER PROGRESS TOWARDS ATTAINMENT.

16. ISSUE:

OTHER DISTRICTS THAT CONTRIBUTE TO THE PROBLEM DO NOT HAVE CONTROLS AS STRINGENT AS THOSE PROPOSED FOR KERN COUNTY. NEW CONTROLS WILL NOT BE ABLE TO CONTRIBUTE TO ATTAINMENT OF THE OZONE STANDARD BECAUSE OF THE HIGH LEVEL OF POLLUTANT TRANSPORT INTO KERN COUNTY. BACKGROUND CONCENTRATIONS SHOULD ALSO BE GIVEN DUE CONSIDERATION IN DEVELOPING CONTROL STRATEGIES. THE EFFECTS OF TRANSPORT OF POLLUTANTS FROM KERN COUNTY INTO THE SOUTHEAST DESERT AIR BASIN SHOULD ALSO BE CONSIDERED.

KERN COUNTY SUPERVISOR TRICE HARVEY, KERN COUNTY APCD, CHEVRON, GREATER BAKERSFIELD CHAMBER OF COMMERCE, FRITO-LAY, SHELL CALIFORNIA, CHINA LAKE NAVAL WEAPONS CENTER AND OTHERS

RESPONSE:

ONE DAY SIMULATIONS INDICATE THAT THE STAFF'S PROPOSED CONTROLS WOULD REDUCE THE OZONE STANDARD VIOLATIONS BY 1995, WHILE MEASURES IN THE ADOPTED KERN COUNTY PLAN WOULD INCREASE THEM. ALTHOUGH A VALLEYWIDE ANALYSIS IS NOT AVAILABLE, ATTAINMENT OF THE STANDARD MAY REQUIRE BOTH UPWIND AND LOCAL CONTROLS. AS STATED IN THE HEARING, THE BOARD HAS COMMITTED ITSELF TO THE SAN JOAQUIN VALLEY MODELING STUDY. THE PLAN REVISIONS PROPOSED BY THE STAFF WILL RESULT IN ALL REASONABLY AVAILABLE MEASURES BEING CONSIDERED. THUS, TRANSPORT OF POLLUTANTS INTO THE SOUTHEAST DESERT AIR BASIN WILL BE REDUCED TO THE MAXIMUM EXTENT FEASIBLE.

17. ISSUE:

MULTI-DAY MODELING STUDIES HAVE LOWER UNCERTAINTIES THAN SINGLE DAY SIMULATIONS. THEREFORE, THE SAI RESULTS INDICATING OZONE INCREASES FROM NOX CONTROLS ARE MORE RELIABLE THAN THE ARB RESULTS INDICATING BENEFITS FROM NOX CONTROLS.

KERN COUNTY APCD, CHEVRON AND OTHERS

RESPONSE:

THE MULTI-DAY SIMULATION PERFORMED BY SAI INCORRECTLY PREDICTED THE HYDROCARBON TO OXIDES OF NITROGEN RATIO. FOR THIS REASON THE MULTI-DAY SIMULATION DOES NOT ACCURATELY DETERMINE THE RELATIVE BENEFITS OF HYDROCARBON OR OXIDES OF NITROGEN EMISSION CONTROLS. THE SINGLE DAY SIMULATION USED OBSERVED VALUES TO SPECIFY THE INITIAL CONDITIONS. THE STAFF CONCURS THAT THERE ARE UNCERTAINTIES INVOLVED IN THE SINGLE DAY SIMULATION, BUT THAT THEY DO NOT INVALIDATE THE QUALITATIVE CONCLUSION THAT BENEFITS ARE DERIVED FROM NOX CONTROLS.

18. ISSUE:

THE ARB ROLE IN REVIEWING DISTRICT RULES OR THE SIP IS LIKE AN APPELLATE COURT REVIEWING A LOWER COURT'S DECISION, AND THE ARB MUST UPHOLD THE DISTRICT DETERMINATION, EVEN THOUGH IT MAY DISAGREE WITH THAT DECISION, IF SUBSTANTIAL EVIDENCE SUPPORTS SUCH DETERMINATION.

MARVIN R. COSTON, DEPUTY COUNTY COUNSEL, KERN COUNTY

RESPONSE:

WHILE THE ANALOGY TO AN APPELLATE COURT IS FACIALLY APPEALING, THE ARB IS AN ADMINISTRATIVE BOARD COMPOSED OF NON-ATTORNEYS AND THERE IS NO LEGAL REQUIREMENT THAT COURT STANDARDS OF REVIEW BE IMPOSED UPON THE BOARD. INDEED, THE STATUTE ITSELF PROVIDES SUFFICIENT GUIDANCE REGARDING THE ROLE OF THE BOARD. THE DISTRICT DETERMINATION OF REASONABLY AVAILABLE CONTROL MEASURE IS CONCLUSIVE, UNLESS (AND THIS IS A MAJOR CAVEAT) THE BOARD FINDS IT WILL NOT MEET THE REQUIREMENTS OF THE CLEAN AIR ACT (H&SC SECTION 41651). AS THE AGENCY ULTIMATELY

RESPONSIBLE FOR PREPARATION OF THE SIP (H&SC SECTION 39602), THE BOARD MUST MAKE AN INDEPENDENT DETERMINATION OF WHAT THE CLEAN AIR ACT REQUIRES THE SIP TO CONTAIN. THE BOARD THEN EXAMINES THE MEASURES ADOPTED BY THE DISTRICT TO DETERMINE WHETHER THEY ADEQUATELY FULFILL THESE LEGAL REQUIREMENTS. IN DOING SO THE BOARD IS DIRECTED TO HEAR TESTIMONY AND WEIGH ALL THE EVIDENCE PRESENTED, AND NOT SIMPLY TO RE-EXAMINE THE RECORD BEFORE THE DISTRICT (H&SC SECTIONS 41502 AND 41650). THUS, IT IS CLEAR FROM THE STATUTE THAT THE BOARD MUST INDEPENDENTLY DECIDE WHETHER THE CLEAN AIR ACT REQUIREMENTS HAVE BEEN MET. AS WITH OTHER BOARD DECISIONS, THIS DETERMINATION MUST BE SUPPORTED BY SUBSTANTIAL EVIDENCE IN THE RECORD SO THAT IT IS NOT ARBITRARY, CAPRICIOUS, OR AN ABUSE OF DISCRETION.

19. ISSUE:

BECAUSE THE DETERMINATION OF SIP ADEQUACY MUST BE MADE ON THE BASIS OF "CONFLICTING DATA SUBJECTIVELY INTERPRETED", THE ARB SHOULD DEFER TO THE DISTRICT'S INTERPRETATIONS UNLESS THEY ARE CLEARLY ERRONEOUS.

MARVIN R. COSTON

RESPONSE:

AGAIN, THE BOARD IS NOT AN APPELLATE COURT SUBJECT TO COURT STANDARDS OF REVIEW, BUT HAS BEEN DIRECTED BY THE LEGISLATURE TO SUBMIT A PROPER AND COMPLETE SIP TO THE EPA IN ORDER TO FULFILL THE REQUIREMENTS OF THE CLEAN AIR ACT. IN WEIGHING THE EVIDENCE PRESENTED BY ALL INTERESTED PARTIES, INCLUDING THE DISTRICT AND THE EPA, WHICH IS AFTER ALL THE EXPERT FEDERAL AGENCY SPECIFICALLY CHARGED WITH IMPLEMENTATION OF THE CLEAN AIR ACT, THE BOARD MUST EXERCISE ITS INDEPENDENT JUDGMENT. THE STATUTE REQUIRES THE TAKING OF TESTIMONY, I.E., THE DEVELOPMENT OF AN ADMINISTRATIVE RECORD SEPARATE AND APART FROM THE RECORD BEFORE THE DISTRICT, AND THE STATUTE DIRECTS THE BOARD, "BASED UPON THE RECORD OF THE PUBLIC HEARING" (H&SC SECTION 41502(c)) TO MAKE ITS DETERMINATION. THE LEGISLATURE SET FORTH OTHER EXPLICIT REQUIREMENTS REGARDING THE FINDINGS WHICH THE BOARD MUST PREPARE TO SUPPORT ITS ACTION, AND WHILE THESE REQUIREMENTS ARE SUBSTANTIVELY AND PROCEDURALLY RIGOROUS, THEY NOWHERE REQUIRE THE BOARD TO

DETERMINE THAT THE DISTRICT'S INTERPRETATIONS ARE "UNREASONABLE" OR NOT SUPPORTED BY ANY RATIONAL EVIDENCE BUT RATHER THAT THESE INTERPRETATIONS DO NOT SATISFY THE FEDERAL STATUTE. THE BOARD MUST EXERCISE ITS INDEPENDENT JUDGMENT REGARDING THE REQUIREMENTS OF THE CLEAN AIR ACT AND THEN, AFTER CAREFULLY WEIGHING ALL OF THE TESTIMONY, DETERMINE FOR ITSELF WHETHER THE DISTRICT DETERMINATIONS MET THOSE REQUIREMENTS. ACCORDINGLY, THE ARB IS NOT BOUND BY THE DISTRICT DETERMINATION THAT NOX CONTROLS ARE NOT APPROPRIATE IF IN THE BOARD'S JUDGMENT THE EVIDENCE PRESENTED AT THE HEARING DOES NOT SUPPORT THIS CONCLUSION.

COMMENTS IN SUPPORT OF THE BOARD'S ACTION:

20. THE KERN COUNTY BOARD ADOPTED A WEAKENED PLAN WHICH DOES NOT CONTAIN REASONABLE MEASURES NECESSARY TO REDUCE OZONE CONCENTRATIONS. THE PERMIT PROGRAM MAY LEAD TO INCREASED LEVELS OF EMISSIONS. EMISSIONS THAT ORIGINATE IN KERN COUNTY (AS COMPARED TO EMISSIONS TRANSPORTED INTO THE COUNTY) CONTRIBUTE SIGNIFICANTLY TO THE COUNTY'S AIR POLLUTION PROBLEMS. THE COSTS OF PROPOSED CONTROL MEASURES ARE REASONABLE WHEN COMPARED TO OTHER CONTROL MEASURES.

SIERRA CLUB

21. SINCE NOX IS A SIGNIFICANT OZONE PRECURSOR, IT IS IMPORTANT TO FURTHER REDUCE NOX EMISSIONS.

AMERICAN LUNG ASSOCIATION OF KERN COUNTY

THE FOLLOWING COMMENTS PRESENTED BY THE ENVIRONMENTAL PROTECTION AGENCY SUPPORT THE ARB STAFF'S RECOMMENDATIONS AND THE BOARD'S ACTION:

22. EPA SUPPORTS THE CONCLUSIONS AND RECOMMENDATIONS MADE BY THE ARB STAFF ON THE MODEL'S RESULTS. THE PLAN ADOPTED BY KERN COUNTY DOES NOT FULFILL THE REQUIREMENTS OF THE CLEAN AIR ACT.

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : September 23, 1986

Subject : Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-76

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : March 12, 1987

Subject: Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-76
86-104
87-17

State of California

Memorandum

To : Gordon Van Vleck
Secretary for Resources

Date : October 23, 1986

Subject : Withdrawal of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

On September 23, 1986 the Air Resources Board forwarded to you for posting its notice of decisions and responses to environmental issues raised during the comment period with regard to the Kern County Nonattainment Area Plan pursuant to Public Resources Code Section 21080.5(d)(2)(v) and Title 17, California Administrative Code, Section 60007(b), (copies attached). Because certain of these actions may be reconsidered, the ARB hereby withdraws the September 23 notice of decisions and responses to environmental issues.

Please call Leslie Krinsk, ARB Staff Counsel, at 322-2884 if you have any questions regarding this matter.

Attachments

RECEIVED
THE RESOURCES AGENCY
OCT 23 1986
Office of the Secretary

State of California
AIR RESOURCES BOARD

Resolution 86-77
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 126-18, entitled "Monitoring Program for Estimation of Dry Acidic Gas and Aerosol Deposition in California," has been submitted by Desert Research Institute;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 126-18, entitled "Monitoring Program for Estimation of Dry Acidic Gas and Aerosol Deposition in California," submitted by Desert Research Institute, for a total amount not to exceed $1,430,606.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 126-18, entitled "Monitoring Program for Estimation of Dry Acidic Gas and Aerosol Deposition in California," submitted by Desert Research Institute, for a total amount not to exceed $1,430,606.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $1,430,606.

I hereby certify that the above is a true and correct copy of Resolution 86-77, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-11-6 (b) (1)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 126-18 entitled "Monitoring Program for Estimation of Dry Acidic Gas and Aerosol Deposition in California"

RECOMMENDATION: Adopt Resolution 86-77 approving Proposal No. 126-18 for funding in an amount not to exceed $1,430,606.

SUMMARY: The objective of this project is to establish and operate for one year a network of comprehensive meteorological and aerometric measurements to estimate dry deposition throughout California. This network would form the basis for an ongoing, long-term dry deposition monitoring program to be continued by ARB.

The Kapiloff Acid Deposition Act of 1982 requires the Board to establish and operate a statewide, long-term monitoring network to detect and measure levels and effects of acid deposition. Accordingly, the Board established a long-term wet deposition monitoring network in 1983, and this network, now consisting of 35 stations statewide, has been operating successfully for three years. However, in 1982, methods for measuring dry deposition were not sufficiently developed to establish a routine dry deposition monitoring network. Therefore, beginning in 1983 the Board undertook a series of projects to select, test, and, as necessary develop a suitable approach for estimating dry deposition in California. In early 1984, ARB sponsored a workshop on dry deposition to obtain recommendations on the most feasible course to follow for developing a routine monitoring network. Based on the results of that workshop the ARB, with the advice and concurrence of its Scientific Advisory Committee, adopted the approach of measuring atmospheric concentrations of acidic material and inferring the deposition flux using meteorological methods. Subsequent studies sponsored by the Board and by others have focused on the development of methods for measuring nitric acid and other important compounds in the atmosphere, and culminated in the Board's Nitrogen Species Measurement Methods

Comparison Study. Related research sponsored by the Board and carried out simultaneously has included studies of: acidic particles in the atmosphere and using leaf washing as a direct measure of particle deposition, using the virtual dichotomous impactor to measure nitric acid and particle nitrate concentrations, and developing methods for measuring atmospheric concentrations of hydrochloric and sulfuric acids. In part because of the success of these early Board-sponsored development studies, the Board was able to sponsor, beginning in 1986, the establishment of a nine site monitoring network for acid gases and particles in the South Coast Air Basin. That network was set up and is being operated for a period of one year by a research team at Caltech.

The objective of this project is to establish and operate a network designed to provide comprehensive measurements of acidic species and meteorology to estimate the spatial and temporal variability of dry deposition throughout the state for twelve months beginning in July 1987. In addition, the contractor will provide all necessary documentation to support subsequent operation of the network by ARB. The network is designed to represent a wide cross section of California in terms of geographic location and physical characteristics. The attached map indicates the sites included in this project.

The Desert Research Institute would be the prime contractor and would be responsible for overall project management, equipment procurement and testing, site installation, field operations, continuous data processing, and data management. Environmental Research and Technology Inc., as a subcontractor to DRI, would be responsible for substrate preparation, the major amount of sample analysis, and data processing. Dr. John Watson, Associate Research Professor at the Energy and Environmental Center of DRI, will be the program manager. Dr. Kochy Fung from ERT is proposed as laboratory operations manager.

This project will be among the first of its kind in the nation. In addition it will be the first statewide network in California established to provide routine, long-term data on dry acid deposition. Complementary efforts now being planned by the U. S. Environmental Protection Agency and the Electric Power Research Institute provide for nationwide monitoring networks to begin operation in 1987, with several stations located in California.

B U D G E T S U M M A R Y

Desert Research Institute

"Monitoring Program for Estimation of
Dry Acidic Gas and Aerosol Deposition in California,"

BUDGET ITEMS:

Salaries	$203,352	
Benefits	51,659	
Supplies	65,006	
Other Costs[1]	301,099	
Equipment[2]	322,700	
Travel	35,414	
TOTAL, Direct Costs		$ 979,230
TOTAL, Indirect Cost		451,376
	TOTAL PROJECT COST	$1,430,606

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1 Includes $220,499 for chemical analysis of approximately 28,000 samples, and $35,100 for data processing

2 Includes $135,650 for nine aerosol/gas samplers, $34,565 for meteorological equipment, $27,810 for data loggers, $55,395 for shelters, ozone monitors, and wet/dry bucket samplers, and $31,091 for spare parts

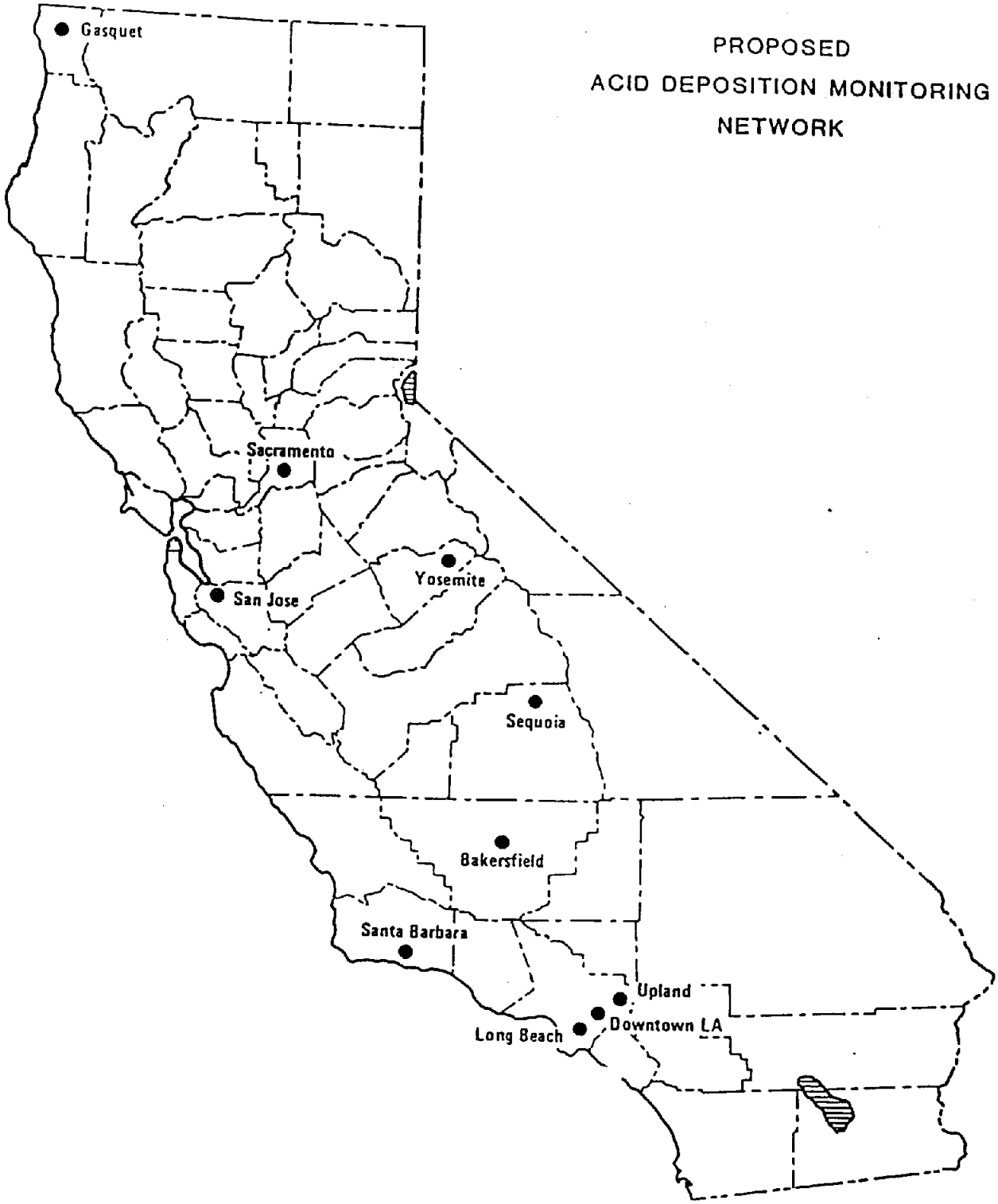

Figure 1 Proposed Locations of CADMP Phase II Sampling Sites in California

State of California
AIR RESOURCES BOARD

Resolution 86-78
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 124-18, entitled "South Coast Air Quality Study (SCAQS) Sampler," has been submitted by AeroVironment, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 124-18, entitled "South Coast Air Quality Study (SCAQS) Sampler," submitted by AeroVironment, Inc. for a total amount not to exceed $198,216.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 124-18, entitled "South Coast Air Quality Study (SCAQS) Sampler," submitted by AeroVironment, Inc. for a total amount not to exceed $198,216.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $198,216.

I hereby certify that the above is a true and correct copy of Resolution 86-78, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM: 86-11-6 (b)(2)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 124-18 entitled "Southern California Air Quality Study Sampler"

RECOMMENDATION: Adopt Resolution 86-78 approving Proposal No. 124-18 for funding in an amount not to exceed $198,216.

SUMMARY: The purpose of this project is to provide for the design, construction and testing of air sampling equipment for ARB's nine intensive (Type B) monitoring stations to be operated as part of the Southern California Air Quality Study.

The Air Resources Board has been planning an intensive study of air quality in the South Coast Air Basin (SoCAB) since late 1984. The overall goal of the Southern California Air Quality Study (SCAQS) is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin that can be used to test, evaluate and improve elements of air quality simulation models for oxidants, PM_{10}, fine particles, toxic air contaminants, and acidic species.

Under this proposal, AeroVironment (AV) would build air samplers for ARB's nine "Type B" monitoring sites, with modules to collect gases, fine particles (<2.0 micrometers diameter), and inhalable particles (<10 micrometers diameter). AV would first construct two prototype samplers and test them to evaluate accuracy and precision. After the prototypes are accepted by ARB, seven more samplers would be constructed. AV would conduct side-by-side tests of all samplers to ensure that they operate in an equivalent manner. The nine samplers would then be operated at the Type B sites by AV personnel under an existing ARB contract with AeroVironment.

The proposed work is a part of the ARB's core program for SCAQS. The sampler design, construction, and testing are currently on the critical path in the overall SCAQS plan. The research results from SCAQS will aid the Board in making decisions related to control strategies in the SoCAB.

The principal investigator for this project is Mr. David Wilbur, and the contractor is AeroVironment.

State of California
AIR RESOURCES BOARD

Resolution 86-79
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 122-18, entitled "Evaluation of Methods for Measurement of Snowfall and Collection of Snow for Chemical Analysis," has been submitted by the U. S. Department of Agriculture, Forest Service;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 122-18, entitled "Evaluation of Methods for Measurement of Snowfall and Collection of Snow for Chemical Analysis," submitted by the U. S. Department of Agriculture, Forest Service for a total amount not to exceed $113,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 122-18, entitled "Evaluation of Methods for Measurement of Snowfall and Collection of Snow for Chemical Analysis," submitted by the U. S. Department of Agriculture, Forest Service for a total amount not to exceed $113,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $113,000.

I hereby certify that the above is a true and correct copy of Resolution 86-79, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-11-6 (b) (3)
DATE: September 4, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 122-18 entitled "Evaluation of Methods for Measurement of Snowfall and Collection of Snow for Chemical Analysis."

RECOMMENDATION: Adopt Resolution 86-79 approving Proposal No. 122-18 for funding in an amount not to exceed $113,000.

SUMMARY: The purpose of this study is to evaluate methods for the collection of snow samples for chemical analysis and measurement of snowfall volume for use in routine monitoring of atmospheric deposition at a high elevation site.

The Sierra Nevada range is of particular interest due to the sensitivity of Sierra lakes to the effects of acid deposition. Snow accounts for up to 95% of the total precipitation at these sites and is the major pathway for acidic deposition. The standard wet/dry buckets which are currently used in most deposition monitoring networks are ill-suited for collecting snow. The large amounts of snowfall in some areas of California can cause frequent overflows of the collection buckets and collected snow can be blown out of the wet bucket or into the "dry" bucket by strong winds. Additionally, the resistance grid sensors can fail to activate during cold windy events. In addition to difficulties in collecting representative snow samples, large errors can exist in measurements of snowfall by standard rain gauges, particularly in areas subject to high winds.

A field study will be conducted in the winter of 1986-87 by the U.S. Forest Service and the University of California, Santa Barbara to evaluate the performance of precipitation gauging systems. The study will be conducted at the research facilities located at the Central Sierra Snow Laboratory in Soda Springs and at the Mammoth Mountain site. Snowfall will be measured by various methods and relative collection rates of different methods will be determined. The effect of various sampling periods (event, weekly, etc.) and sample storage and handling procedures upon the accuracy and precision of the snowfall measurements and chemical analyses will investigated. Evaluated methods would be used

by the ARB in the existing statewide, long-term monitoring network to determine the temporal and spatial variability of acid (snow) deposition. In addition, replicate snow core samples of the annual snowpack will be collected in late winter at about ten sites in the Sierra Nevada and the San Bernardino Mountains in order to determine the spatial distribution of snow chemistry.

The research contractor is U. S. Department of Agriculture, Forest Service. The Principal Investigator is Dr. Neil Berg.

BUDGET SUMMARY

U.S. Department of Agriculture, Forest Service

"Evaluation of Methods for Measurement of Snowfall and Collection of Snow for Chemical Analysis"

BUDGET ITEMS:

Salaries	$44,403	
Benefits	9,459	
Supplies[1]	10,405	
Other Costs[2]	8,700	
Travel[3]	10,200	
Equipment[4]	25,800	
TOTAL, Direct Costs		$108,967
TOTAL, Indirect Cost		4,033
	TOTAL PROJECT COST	$113,000

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1 Includes $4,200 for field and office supplies and $5,705 for chemical supplies.

2 Includes $7,200 for computer use

3 Includes travel cost of $9,000 for the field study

4 Includes $12,000 for five precipitation gauges, $6,150 for three data recording systems and $4,750 for three sets of meteorological instruments

State of California
AIR RESOURCES BOARD

Resolution 86-80
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 120-18, entitled "Development of an Inventory of Materials Potentially Sensitive to Ambient Atmospheric Acidity in the South Coast Air Basin," has been submitted by Valley Research Corporation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 120-18, entitled "Development of an Inventory of Materials Potentially Sensitive to Ambient Atmospheric Acidity in the South Coast Air Basin," submitted by Valley Research Institute, for a total amount not to exceed $248,624.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 120-18, entitled "Development of an Inventory of Materials Potentially Sensitive to Ambient Atmospheric Acidity in the South Coast Air Basin," submitted by Valley Research Institute, for a total amount not to exceed $248,624.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $248,624.

I hereby certify that the above is a true and correct copy of Resolution 86-80, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-11-6 (b) (4)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 120-18 entitled "Development of an Inventory of Materials Potentially Sensitive to Ambient Atmospheric Acidity in the South Coast Air Basin."

RECOMMENDATION: Adopt Resolution 86-80 approving Proposal No. 120-18 for funding in an amount not to exceed $248,624.

SUMMARY: The purpose of this study is to develop a comprehensive inventory of exposed materials that are potentially sensitive to acid deposition for the South Coast Air Basin (SoCAB).

The Kapiloff Acid Deposition Act requires the Air Resources Board to assess the economic impact of acid deposition upon materials as a part of a comprehensive research program to determine the nature, extent, and potential effects of acid deposition in California. This study, together with others sponsored by the Board, the Electric Power Research Institute, and the National Acid Precipitation Assessment Program (NAPAP), should provide the necessary information to prepare an overall economic assessment of the damages to materials in the SoCAB as a result of acid deposition.

Under this proposal Valley Research Corporation (VRC) will develop an inventory of exposed materials for residential and non-residential buildings and for non-building materials. The inventory of the residential buildings will be developed by conducting telephone surveys of 1,500 households and field surveys of 200 households. The inventory of multi-family residential buildings and non-residential buildings will be conducted using aerial photo analysis. The inventory of non-building materials (infrastructure) would be developed by conducting a limited survey and by using engineering calculations. VRC proposes to extrapolate the inventory to the entire SCAB using the building count-method recommended by NAPAP.

BUDGET SUMMARY

Valley Research Corporation

"Development of an Inventory of Materials Potentially Sensitive to Ambient Atmospheric Acidity in the South Coast Air Basin"

BUDGET ITEMS:

Salaries	$118,564	
Benefits	39,294	
Supplies	1,100	
Other Cost[1]	22,500	
Travel	9,510	
TOTAL, Direct Costs		$190,968
TOTAL, Indirect Cost		57,656
TOTAL PROJECT COST		$248,624

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1 Includes aerial photography, computer time, word processing, reproduction

State of California
AIR RESOURCES BOARD

Resolution 86-81
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 114-18, entitled "Conference to Develop Recommendations for a Plan for Research to Determine the Effects of Acid Deposition and Other Air Pollutants on California Forests," has been submitted by Humboldt State University Foundation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 114-18, entitled "Conference to Develop Recommendations for a Plan for Research to Determine the Effects of Acid Deposition and Other Air Pollutants on California Forests" submitted by Humboldt State University Foundation, for a total amount not to exceed $35,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 114-18, entitled "Conference to Develop Recommendations for a Plan for Research to Determine the Effects of Acid Deposition and Other Air Pollutants on California Forests" submitted by Humboldt State University Foundation, for a total amount not to exceed $35,000.

BE IT FURTHER RESOLVED, that the Executive Office is hereby authorized to initiate administrative procedures and execute all necessary documents and contrats for the research effort proposed herein in an amount not to exceed $35,000.

I hereby certify that the above is a true and correct copy of Resolution 86-81, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-11-6 (b) (5)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 114-18 entitled "Conference to Develop Recommendations for a Plan for Research to Determine the Effects of Acid Deposition and Other Air Pollutants on California Forests"

RECOMMENDATION: Adopt Resolution 86-81 approving Proposal No. 114-18 for funding in an amount not to exceed $35,000.

SUMMARY: The objectives of this study are : (1) to review the literature and summarize what is known about the effects of atmospheric deposition on forests, (2) to identify and summarize ongoing research in this area, and (3) to provide expert assistance in designing a study plan for California that would allow for an assessment of the impact of acidic deposition and other air pollutants on forests in the state.

To meet these objectives the proponents plan to convene a workshop to include experts in the fields of forest ecology and air pollution and acid deposition effects. The proponents will synthesize a research plan based on review papers provided by the workshop participants and on focused discussion during the two-day session.

The contractor is Humboldt State University Foundation and the principal investigator is Dr. Susan Bicknell.

B U D G E T S U M M A R Y

Humboldt State University Foundation

"Conference to Develop Recommendations for a Plan for Research to Determine the Effects of Acid Deposition and Other Air Pollutants on California Forests"

BUDGET ITEMS:

Salaries	$ 9,898	
Benefits	2,734	
Supplies & Expenses	4,500	
Travel[1]	10,303	
Other Costs[2]	3,000	
TOTAL, Direct Costs		$30,435
TOTAL, Indirect Cost		4,565
	TOTAL PROJECT COST	$35,000

1 Includes travel and per diem for symposium participants
2 Honoraria for symposium participants

State of California
AIR RESOURCES BOARD

Resolution 86-82
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 130-18, entitled "Vegetation Process Studies," has been submitted by the University of California, Los Angeles;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 130-18, entitled "Vegetation Process Studies," submitted by the University of California, Los Angeles, for a total amount not to exceed $190,031.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 130-18, entitled "Vegetation Process Studies," submitted by the University of California, Los Angeles, for a total amount not to exceed $190,031.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $219,398.

I hereby certify that the above is a true and correct copy of Resolution 86-82, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-11-6 (b) (6)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 130-18 entitled "Vegetation Process Studies"

RECOMMENDATION: Adopt Resolution 86-82 approving Proposal No. 130-18 for funding in an amount not to exceed ~~$219,398~~ 190,031.

SUMMARY: This project is a continuation of work started in 1984 as part of the Board's Integrated Watershed Study at Sequoia National Park. The project includes both field and laboratory research to assess and document the potential for damage to vegetation due to acid deposition in the Sierra Nevada.

Under this proposal, current studies would be continued at two sites in the Park: Emerald Lake (9200') and Log Meadow (6500'). The specific tasks to be completed as part of this study are: (1) determination of biomass and productivity of major vegetation types; (2) determination of pools and fluxes of nitrogen, phosphorus, sulfur and aluminum in vegetation; (3) investigation of vegetation response to aluminum toxicity (potentially caused by acid deposition) through a series of lab experiments; and (4) integration of four years of field data at these two sites.

The investigators will also participate in a modeling exercise to include the vegetation data in a biogeochemical analysis of the Emerald Lake Watershed to try to assess response of the whole ecosystem to potential changes in acid deposition.

The contractor will be the University of California at Los Angeles and the principal investigator will be Dr. Phillip Rundel.

State of California
AIR RESOURCES BOARD

Resolution 86-83
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 131-18, entitled "Analysis and Interpretation of the 1985 ARB Projects in Sequoia National Park," has been submitted by Dr. Leonard O. Myrup;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 131-18, entitled " Analysis and Interpretation of the 1985 ARB Projects in Sequoia National Park," submitted by Dr. Leonard O. Myrup, for a total amount not to exceed $8,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 131-18, entitled "Analysis and Interpretation of the 1985 ARB Projects in Sequoia National Park," submitted by Dr. Leonard O. Myrup for a total amount not to exceed $8,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $8,000.

I hereby certify that the above is a true and correct copy of Resolution 86-83, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM: 86-11-6 (b) (7)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 131-18 entitled "Analysis and Interpretation of the 1985 ARB Projects at Sequoia National Park"

RECOMMENDATION: Adopt Resolution 86-83 approving Proposal No. 131-18 for funding in an amount not to exceed $8,000.

SUMMARY: The purpose of this study is to integrate and assess the results from coordinated air quality studies carried out in Sequoia National Park.

In 1985 the ARB funded four atmospheric transport and deposition studies at Sequoia National Park. Preliminary results of these studies were presented at a workshop at Sequoia National Park in January, 1986 and at a second workshop organized by ARB staff in March, 1986. Through discussions at these workshops, it has become clear that a need exists to integrate the results of the four studies before further research approaches can be formulated. This proposal is in response to that need.

The proponents will review the four reports submitted by the individual contractors, integrate the data from the four studies, and then interpret the integrated data set. They will identify and document similarities and differences in the data between any of the four studies, and will attempt to resolve any areas of apparent disagreement. They will prepare a report describing their findings, and will prepare a list of recommended research needed to fill gaps or resolve areas of conflict between results from different researchers.

The principal investigators and contractors are Drs. Leonard Myrup and Robert Flocchini.

State of California
AIR RESOURCES BOARD

Resolution 86-84
September 25, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an augmentation proposal, Number 030-4A, entitled "A Study of the Influence of Sediments in Buffering Aquatic Systems and Development of a Model of the Acidification Process," has been submitted by the University of California, Berkeley;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 030-4A, entitled "A Study of the Influence of Sediments in Buffering Aquatic Systems and Development of a Model of the Acidification Process," submitted by the University of California, Berkeley, for a total amount not to exceed $39,760.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 030-4A, entitled "A Study of the Influence of Sediments in Buffering Aquatic Systems and Development of a Model of the Acidification Process," submitted by the University of California, Berkeley, for a total amount not to exceed $39,760.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $46,591.

I hereby certify that the above is a true and correct copy of Resolution 86-84, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-11-6 (b) (8)
DATE: September 25, 1986

State of California
AIR RESOURCES BOARD

ITEM: Augmentation Proposal No. 030-4A entitled "A Study of the Influence of Sediments in Buffering Aquatic Systems and Development of a Model of the Acidification Process"

RECOMMENDATION: Adopt Resolution 86-84 approving Proposal No. 030-4A for funding in an amount not to exceed ~~$46,591~~ 39,760.

SUMMARY: This proposal is a request to augment an existing ARB Contract, No. A4-042-32, to include additional time and funds to complete a modified and extended scope of work. The contractors have been involved in the collection of field data on sediment-water column exchange at three high-elevation lakes of the Sierra Nevada for three field seasons.

The objective of the original study (Contract No. A4-042-32), begun in July 1984, was to study and quantify the sediment-water column exchange processes of three lakes in the Sierra Nevada and to investigate how these processes influence the buffering capacity/alkalinity of these lakes. This information is believed to be essential to our understanding of the sensitivity and susceptibility of low-alkalinity lakes in California to acidification. The objective remains unchanged. Based on preliminary results, however, the contractor identified and the ARB staff concurred with the need for additional (under-the-ice) samples in order to develop and validate a computer model of lakewater and sediment alkalinity in order to meet the overall objective.

The project is designed to investigate the role that lake sediments play in neutralizing acid inputs to sensitive Sierra lakes. The contractors studied this question by collecting samples of sediments, pore water in the sediments, and overlying lake water. They have also performed experiments in the laboratory to understand the rates at which sediments provide buffering material to the overlying water. These field and laboratory data are being used to validate a model being formulated to explain how sediments interact with lakewater to buffer acids.

The ARB staff and Scientific Advisory Committee recommended that this additional work be completed and that the supplemental set of under-the-ice sediment pore water samples be analyzed. This will require that the contractors receive additional funds for personnel and equipment and more time to run the models and to complete the final report. The result of this additional effort will be a more complete, semi-quantitative understanding of the importance of sediments in buffering acidic inputs to sensitive subalpine lakes in the Sierra Nevada. The ARB staff and the Scientific Advisory Committee did consider the alternative of augmenting the project after the funds were exhausted but determined that the delay caused would be unacceptable since the results of this study are needed as input to other projects already in place.

The principal investigators are Drs. John Harte and Ronald Amundson.

BUDGET SUMMARY

University of California, Berkeley

"A Study of the Influence of Sediments in Buffering Aquatic Systems and Development of a Model of the Acidification Process"

BUDGET ITEMS:

Salaries	$17,369	
Benefits	3,776	
Supplies & Expenses	15,000*	
Travel	-0-	
TOTAL, Direct Costs		$36,145
TOTAL, Indirect Cost		10,446
TOTAL PROJECT COST		~~$46,591~~ 39,760

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* Includes water analyses, computer time and publication expenses

State of California
AIR RESOURCES BOARD

Resolution 86-85

September 25, 1986

Agenda Item No.: 86-11-2

WHEREAS, on July 25, 1985, pursuant to Health and Safety Code Section 39662, the Air Resources Board (ARB or the "Board") identified ethylene dibromide as a toxic air contaminant for which there is not sufficient available scientific evidence to support the identification of a threshold exposure level below which no significant adverse health effects are anticipated (Title 17, California Administrative Code, Section 93000);

WHEREAS, following identification of ethylene dibromide as a toxic air contaminant, the staff prepared for the Board's review a report titled "The Need for Controlling Airborne Ethylene Dibromide" (the "Report") which addresses the present and future uses and emissions of ethylene dibromide, the exposure to and risk from ethylene dibromide, the physical and chemical characteristics of ethylene dibromide in the ambient air, and the potential for development of ethylene dibromide control measures;

WHEREAS, the people of California were exposed to an annual average ambient ethylene dibromide concentration of approximately six parts per trillion in 1985;

WHEREAS, the Department of Health Services (DHS) concluded in its health effects evaluation that the added lifetime cancer risk from ambient ethylene dibromide exposure ranges from 1.02 to 5.53 excess cases per million people continuously exposed to ten parts per trillion ethylene dibromide;

WHEREAS, the Scientific Review Panel, established pursuant to Health and Safety Code Section 39670, found that the DHS' estimates of ethylene dibromide risk "...are reasonable, appropriately conservative, and are based on valid scientific judgment";

WHEREAS, recent federal regulations affecting the use of ethylene dibromide (restrictions on its use as a pesticide and restrictions on lead content in gasoline) are expected to reduce the 1985 emission levels approximately 70 percent by 1990;

WHEREAS, in the absence of additional control measures for ethylene dibromide, the range of individual cancer risk from exposure to ambient concentrations of ethylene dibromide in California in the year 1990 is estimated to be below one excess lifetime cancer case per million persons;

WHEREAS, ethylene dibromide emissions from the use of leaded vehicular fuel is expected to decline significantly in the future without ARB adoption of control measures, and there are no other sources of ethylene dibromide emissions that the ARB or the local districts have clear authority to regulate under the Health and Safety Code;

WHEREAS, the staff has recommended in the Report that additional ethylene dibromide control measures should not be developed at this time, but that monitoring of ambient ethylene dibromide levels should continue and that if future ambient levels do not decrease as expected, the staff should advise the Board and again review the need for development of ethylene dibromide control measures;

WHEREAS, the staff of the Board made the Report available to the public and submitted it for review to the Technical Review Group (TRG) consisting of representatives from the districts, the ARB and Environmental Protection Agency;

WHEREAS, at a duly noticed public meeting held September 25, 1986, the Board reviewed the Report and considered the written comments and public testimony it received; and

WHEREAS, the Board finds that the Report adequately discusses the public health risks from ethylene dibromide exposure and the need for ethylene dibromide control measures.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the staff recomendation in the report titled "The Need for Controlling Airborne Ethylene Dibromide" that ethylene dibromide control measures need not be developed at this time; that the ARB staff should continue to monitor ambient levels of ethylene dibromide; and that if future ambient levels do not decrease as expected, staff should advise the Board and again review the need for development of ethylene dibromide control measures.

I hereby certify that the above is a true and correct copy of Resolution 86-85, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Resolution 86-86

September 25, 1986

Agenda Item No.: 86-11-1

WHEREAS, on November 22, 1985, the Board established a committee of three of its members to gather information pertinent to the setting of Board policy regarding visibility;

WHEREAS, the Committee on Visibility ("the Committee") held three public meetings:

On February 27, 1986, the Committee met for the purpose of establishing a plan for future public meetings or colloquia;

On April 30, 1986, the Committee sponsored a colloquium on issues affecting the State's visibility regulatory policy and the relationship between state visibility regulation and the federal requirement for visibility protection in national parks and wilderness areas in California;

On June 10, 1986, the Committee sponsored a colloquium to address technical issues regarding measurement, modeling of visual air quality and identification of sources of visibility-degrading pollutants;

WHEREAS, the Committee has completed its formal review of the technical and policy issues associated with California visual air quality;

WHEREAS, the Committee has submitted its report to the Board regarding the management of visual air quality; and,

WHEREAS, the Board finds that the recommendations of the Committee present an appropriate course of action for the staff to follow regarding protection of visibility in California.

NOW, THEREFORE, BE IT RESOLVED, the Board hereby directs the staff as follows regarding the federal visibility protection program:

1. Continue to monitor U.S. Environmental Protection Agency (EPA) rulemaking for visibility and comment on all relevant draft regulations and propose an appropriate course of action to the Board after EPA has promulgated draft State Implementation Plan (SIP) revisions for California;

2. Continue to support and actively coordinate with EPA and the other participating agencies in the development of the IMPROVE monitoring network, specifically in the selection of monitoring sites and technologies;

3. Compile a review of current information about air quality in the Class I areas in California, and promote the exchange of research and monitoring data among all interested parties.

BE IT FURTHER RESOLVED, the Board hereby directs the staff as follows regarding the State standard for visibility-reducing particles:

1. Develop and present to the Board for adoption an instrumental monitoring method for measurement of visibility degradation, and a restatement of the current statewide and Lake Tahoe Air Basin visibility standards in terms of that measurement;

2. Develop and present to the Board for consideration a non-degradation policy for areas where visual air quality is currently better than required by the statewide standard;

3. When sufficient monitoring data are available, characterize California's visual air quality and begin an air basin-by-air basin review of the standard; when possible, data from major research programs such as the upcoming South Coast Air Quality Study and the proposed San Joaquin Valley Air Quality Study should be integrated into the process of evaluating individual air basin standards;

4. Develop criteria for providing variances or special protection for certain activities within each air basin.

BE IT FURTHER RESOLVED, the Board hereby directs the staff as follows regarding monitoring:

1. Install visibility monitoring instruments alongside existing PM_{10} monitors at as many sites as feasible;

2. Continue to assist and to coordinate with locally operated visibility monitoring and research programs such as the Department of Defense RESOLVE program and the cooperative private-public SCENES program;

3. Include visual air quality analysis as an explicit goal of major research projects such as the upcoming South Coast Air Quality Study and the San Joaquin Valley Air Quality Study;

4. Identify any highly sensitive Class I areas not included in the federal IMPROVE monitoring network and, to the extent resources allow, assume responsibility for monitoring visual air quality at those locations.

BE IT FURTHER RESOLVED, the Board hereby directs the staff as follows regarding other State programs:

1. Continue the program of dynamic allocation of agricultural burning rights, which has dramatically reduced the impact of agricultural burning in the Sacramento Valley;

State of California
AIR RESOURCES BOARD

Resolution 86-87
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1453-129, entitled "The Fate of Hexavalent Chromium in the Atmosphere," has been submitted by Research Triangle Institute;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1453-129, entitled "The Fate of Hexavalent Chromium in the Atmosphere," submitted by Research Triangle Institute, for a total amount not to exceed $168,511.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1453-129, entitled "The Fate of Hexavalent Chromium in the Atmosphere," submitted by Research Triangle Institute, for a total amount not to exceed $168,511.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $168,511.

I hereby certify that the above is a true and correct copy of Resolution 86-87, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (1)
DATE: October 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1453-129 entitled "The Fate of Hexavalent Chromium in the Atmosphere"

RECOMMENDATION: Adopt Resolution 86-87 approving Proposal No.1453-129 for funding in an amount not to exceed $168,511.

SUMMARY: Hexavalent chromium has been identified by the Air Resources Board as a toxic air contaminant. Airborne hexavalent chromium, Cr(VI), may be transformed to the less toxic trivalent chromium, Cr(III), and it may settle out of the air as particulate matter or be washed out with precipitation. However, the rates at which these removal processes occur are not well established.

The primary objective of this study is to establish the rates of reduction of Cr(VI) to Cr(III) in ambient air. Additionally, the investigator will determine the likelihood of Cr(III) oxidation to Cr(VI) in the atmosphere. The Air Resources Board staff anticipates using the results of this study to model the airborne concentrations of chromium downwind of emission sources.

The proposed study incorporates laboratory work to develop or refine necessary analytical methods for chromium; a simulation of atmospheric chemistry processes to obtain order of magnitude conversion rates necessary for field study design; and field work at three chromium emission sources to establish reaction rates for Cr(VI) and Cr(III) interconversion and/or removal processes.

The study will be conducted by Research Triangle Institute. The principal investigator is William F. Gutknecht. Entropy Environmentalists will be subcontracted to conduct the field work, under the direction of William DeWees.

State of California
AIR RESOURCES BOARD

Resolution 86-88
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1445-129, entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements," has been submitted by Sonoma Technology, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1445-129, entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements," submitted by Sonoma Technology, Inc., for a total amount not to exceed $275,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1445-129, entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements," submitted by Sonoma Technology, Inc., for a total amount not to exceed $275,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $275,000.

I hereby certify that the above is a true and correct copy of Resolution 86-88, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (2)
DATE: October 23 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1445-129 entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements."

RECOMMENDATION: Adopt Resolution 86-88 approving Proposal No. 1445-129 for funding in an amount not to exceed $275,000.

SUMMARY: The Southern California Air Quality Study (SCAQS) is a multi-year, integrated air quality study whose overall goal is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin (SoCAB) that can be used to test, evaluate and improve elements of air quality simulation models for oxidants, PM_{10}, fine particles, toxic air contaminants and acidic species. The study will take place in the SoCAB during the summer of 1987 for 12 intensive sampling days and seven intensive sampling days during the winter of 1987-1988. Existing air quality monitoring locations in the SoCAB will be used for surface based measurements. Aircraft will be used to complete the three-dimensional data base that is required.

The purpose of this project is to make the required aircraft measurements during the SCAQS program. Approximately 160 hours of flying time will be used for spiral flight patterns by one aircraft, to make gaseous criteria pollutant measurements on the intensive study days. The additional air sampling aloft that is needed for SCAQS will be conducted under a separate ARB contract with the University of Washington. University of Washington will fly "orbits" with a larger, heavily instrumental aircraft to collect filter samples of cloud water and acidic species. Together, these two projects will provide the spatial and temporal resolution required for adequate characterization of air quality aloft during SCAQS.

The principal invstigator for this project will be Jerry Anderson and the contractor will be Sonoma Technology, Inc.

BUDGET SUMMARY

Sonoma Technology, Inc.

"Southern California Air Quality Study (SCAQS) - Aircraft Measurements"

BUDGET ITEMS:

Salaries	$78,028	
Supplies and Equipment*	81,041	
Aircraft Mechanic	1,370	
Other Costs (Publications and Phone)	1,841	
Travel	18,412	
TOTAL, Direct Costs		$180,692
TOTAL, Indirect Costs		94,308
TOTAL PROJECT COST		$275,000

* Purchased Parts

Calibration Supplies, Filter Media, Shipping	$ 5,879
Subcontracted Items	
Filter Analyses	6,337
PAN, carbonyl, H_2O_2 analysis	9,617
Standard Commercial Items	
Aztec Aircraft (160 hrs. at $180/hr)	28,980
Computer	2,700
Aircraft Data System	2,400
Air Quality Measurements (NOx, SO_2, meteorology meas., etc.)	23,630
Inverters	1,400
Air Conditioners	98

State of California
AIR RESOURCES BOARD

Resolution 86-89
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1444-129, entitled "Southern California Air Quality Study: Meteorology Support Program," has been submitted by Technical and Business Systems;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1444-129, entitled "Southern California Air Quality Study: Meteorology Support Program," submitted by Technical and Business Systems, for a total amount not to exceed $329,148.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1444-129, entitled "Southern California Air Quality Study: Meteorology Support Program," submitted by Technical and Business Systems, for a total amount not to exceed $329,148.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $329,148.

I hereby certify that the above is a true and correct copy of Resolution 86-89, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (3)
DATE: October 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1444-129 entitled "Southern California Air Quality Study: Meteorology Support Program."

RECOMMENDATION: Adopt Resolution 86-89 approving Proposal No. 1444-129 for funding in an amount not to exceed $329,148.

SUMMARY: The purpose of this research proposal is to provide for the collection and analysis of a comprehensive set of core meteorological data in support of SCAQS.

The contractor proposes to operate a RAWINSONDE upper air monitoring network at four locations in the SoCAB which will measure pressure, wind, temperature, and humidity aloft. The contractor will also measure winds-aloft at three additional locations using the pilot-balloon (PIBAL) method. Surface meteorological data, including winds and temperature, will be collected at three locations for a period of three months. Surface and upper-air data will be logged and checked for complete documentation and presented in tables, plotted on graphs, and stored on magnetic tape. Quality control steps will be taken to assure data reliability. In addition, analysis of the meteorological conditions during each intensive study day will be provided for a comprehensive overview of the atmospheric conditions that affect air pollution concentrations. Final revisions, if any, to this proposed study plan will be made by the ARB with the advice and consultation of other sponsors of SCAQS.

The principal investigator for this study will be Donald Lehrman of Technical and Business Systems.

State of California
AIR RESOURCES BOARD

Resolution 86-90
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1426-127A, entitled "Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites," has been submitted by AeroVironment, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1426-127A, entitled "Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites," submitted by AervoVironment, Inc., for a total amount not to exceed $48,409.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1426-127A, entitled "Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites," submitted by AervoVironment, Inc., for a total amount not to exceed $48,409.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $48,409.

I hereby certify that the above is a true and correct copy of Resolution 86-90, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (4)
DATE: October 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-127A entitled Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites."

RECOMMENDATION: Adopt Resolution 86-90 approving Proposal No.1426-127A for funding in an amount not to exceed $48,409.

SUMMARY: This proposal provides for the refurbishment, calibration and construction of aerosol sizing instrumentation which will be used at several of the nine sampling locations. Electrical aerosol analyzers will be used to classify particles into approximately ten size cuts less than 1 um diameter. Optical particle counters will provide size distribution data for particles with diameters greater than 1 um diameter. Nephelometers will be used to measure light scattering properties of airborne particles, which is consistent with the Board's resolution of September 1986 regarding visibility and the need to provide instrumental measurements of light exinction as a part of the SCAQS. This collection of equipment will form the heart of the aerosol sizing instrumentation at each of the Type B stations in the SCAQS network.

The purpose of this proposal is to purchase and/or refurbish loaned aerosol sampling equipment, to be made available during the SCAQS field effort, at minimal cost to the ARB. Where new equipment is needed, Sonoma Technology will, under a separate research proposal, purchase that equipment with no overhead cost to ARB.

The principal investigator for this contract is David Wilbur and the contractor is AeroVironment.

BUDGET SUMMARY

AeroVironment, Inc.

"Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites"

BUDGET ITEMS:

Salaries	$ 3,868	
Equipment:		
Optical Particle Counters (2)	7,500	
Electrical Aerosol Analyzers (2)	4,000	
Nephelometers (9)	9,000	
Printers (8)	2,000	
Misc. Parts	4,000	
Shipping Costs	2,000	
TOTAL, Direct Costs		$ 32,368
TOTAL, Indirect Costs		16,041
TOTAL PROJECT COST		$ 48,409

State of California
AIR RESOURCES BOARD

Resolution 86-91
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1464-130, entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites," has been submitted by Sonoma Technology, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1464-130, entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites," submitted by Sonoma Technology, Inc., for a total amount not to exceed $44,800.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1464-130, entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites," submitted by Sonoma Technology, Inc., for a total amount not to exceed $44,800.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $44,800.

I hereby certify that the above is a true and correct copy of Resolution 86-91, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (5)
DATE: October 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1464-130 entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites."

RECOMMENDATION: Adopt Resolution 86-91 approving Proposal No.1464-130 for funding in an amount not to exceed $44,800.

SUMMARY: This proposal provides for the procurement of aerosol sizing instrumentation which will be used at several of the nine type B sampling locations in the SCAQS network.

The purpose of this proposal is to purchase optical particle counters and associated data acquisition systems for aerosol sampling equipment, to be made available during the SCAQS field effort, at minimal cost to the ARB. As provided under a separate proposal from AeroVironment, borrowed equipment, where available, will be refurbished and calibrated by AV. Under this proposal, remaining equipment needs will be met by the purchase of equipment, without overhead cost to the ARB, by Sonoma Technology, Inc.

The principal investigator will be Dr. Donald Blumenthal of Sonoma Technology, Inc.

BUDGET SUMMARY

Sonoma Technology, Inc.

"Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites"

BUDGET ITEMS:

Equipment Purchase:

Optical Particle Counters (2)	$26,000
Data Acquisition Systems (8)	8,000
A-D Converter Cards (8)	3,600
Multichannel Analyzers (4)	7,200

TOTAL, Direct Costs	$44,800
TOTAL, Indirect Costs	---0---
TOTAL PROJECT COST	$44,800

This project, together with the proposal from AV to refurbish equipment, will provide the following equipment for use during SCAQS: 4 optical particle counters, 2 electrical aerosol analyzers, 9 nephelometers, 8 printers, 8 A-D converter cards, 4 multichannel analyzers, and related peripherals.

State of California
AIR RESOURCES BOARD

Resolution 86-92
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1440-129, entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations," has been submitted by Daniel Grosjean and Associates, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1440-129, entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations," submitted by Daniel Grosjean and Associates, Inc., for a total amount not to exceed $34,302.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1440-129, entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations," submitted by Daniel Grosjean and Associates, Inc., for a total amount not to exceed $34,302.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $34,302.

I hereby certify that the above is a true and correct copy of Resolution 86-92, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (6)
DATE: October 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1440-129 entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations."

RECOMMENDATION: Adopt Resolution 86-92 approving Proposal No. 1440-129 for funding in an amount not to exceed $34,302.

SUMMARY: The objective of this proposal is to provide peroxyacetyl nitrate (PAN) measurements at the nine SCAQS Class B stations during nineteen comprehensive study days in 1987. PAN is an eye irritant, an atmospheric mutagen, and a phytotoxicant, and it is a significant fraction of the atmospheric nitrogen budget in polluted urban air. PAN is not currently monitored at the South Coast Air Quality Management District monitoring locations, and this effort will be the first ever to measure PAN spatially throughout the South Coast Air Basin over a number of days.

The data obtained from this study will be used in the development and validation of the next generation of air quality simulation models for oxidant and PM_{10} in the South Coast Air Basin.

The principal investigator for this study is Dr. Daniel Grosjean of Daniel Grosjean and Associates, Inc.

State of California
AIR RESOURCES BOARD

Resolution 86-93
October 23, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1458-129, entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin," has been submitted by the Environmental Research and Technology, Inc.;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1458-129, entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin," submitted by the Environmental Research and Technology, Inc., for a total amount not to exceed $167,577.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1458-129, entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin," submitted by the Environmental Research and Technology, Inc., for a total amount not to exceed $167,577.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $167,577.

I hereby certify that the above is a true and correct copy of Resolution 86-93, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (7)
DATE: October 23, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1458-129 entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin."

RECOMMENDATION: Adopt Resolution 86-93 approving Proposal No. 1458-129 for funding in an amount not to exceed $167,577.

SUMMARY: The purpose of this project is to determine baseline qualitative and quantitative data on the concentrations of certain chlorinated dioxins and furans in ambient air. These data will be used by the ARB and others for both health assessment purposes and to compare current concentrations with future concentrations.

Certain chlorinated dibenzodioxins and dibenzofurans have been determined by the Air Resources Board to be toxic air contaminants subject to review and possible regulation in accordance with Section 39650, et seq. of the California Health and Safety Code. The dioxin and furan compounds of concern are the tetra-, penta-, hexa- and heptachloro derivatives.

The ARB has identified the need for background monitoring data to determine current population exposures and to provide a base of concentrations for assessing effects of future emissions from new sources. The most probable sources for the formation and/or synthesis of these toxic air pollutants are incinerators and boilers burning chlorinated industrial wastes and municipal refuse incinerators. Currently, no monitoring data for dioxins or furans have been reported for California.

The principal investigator for this project will be Dr. Alan Lloyd. The contractor will be Environmental Research and Technology, Inc.

BUDGET SUMMARY

Environmental Research and Technology, Inc.

"Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin"

BUDGET ITEMS:

Salaries	$14,350	
Supplies[1]	10,600	
Travel	3,175	
Other Costs[2]	7,100	
Subcontractor[3]	89,300	
TOTAL, Direct Costs		$124,525
TOTAL, Indirect Costs		43,052
	TOTAL PROJECT COST	$167,577

1 Laboratory and Sampling Supplies
2 Computer, Shipping, Postage, Reports
3 Subcontract with ENSECO-CAL for Analysis of 80 Samples

State of California
AIR RESOURCES BOARD

Resolution 86-94

November 20, 1986

Agenda Item No.: 86-13-3

WHEREAS, Section 39601 of the Health and Safety Code authorizes the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Sections 43101 and 43102 of the Health and Safety Code authorize the Board to adopt and implement emission standards for new motor vehicles and provide that no new motor vehicle shall be certified by the Board unless the vehicle meets the adopted emission standards;

WHEREAS, in 1981 the Legislature enacted AB 965, which amended Section 43102 of the Health and Safety Code to require the Board to adopt certification and enforcement regulations which will allow a manufacturer to certify in California federally certified light-duty motor vehicles which would otherwise be unavailable in this state, provided that their emissions are offset by the manufacturer's California-certified motor vehicles whose emissions are below the California standards;

WHEREAS, in order to implement AB 965, in 1982 the Board adopted Section 1960.5 and amended Section 2061, Title 13, California Administrative Code, which, as presently amended, establish the incorporated "Guidelines for Certification of 1983 through 1987 Model Year Federally-Certified Light-Duty Motor Vehicles for Sale in California" (the "Guidelines");

WHEREAS, the present Guidelines do not apply to vehicles produced after the 1987 model year;

WHEREAS, the Guidelines impose a ceiling on the percentage of oxides of nitrogen (NOx) offset credits available for light-duty vehicles, derived in 1982 from calculations using the existing optional 0.7 gram per mile (g/mi) NOx standards;

WHEREAS, on April 24, 1986 the Board approved regulatory amendments which will generally phase-out the optional light-duty vehicle NOx standards over five years starting with the 1989 model year, making only the primary 0.4 g/mi NOx standard applicable for gasoline-powered light-duty vehicles;

WHEREAS, on July 24, 1986, the Board approved amendments to the test procedures for certifying passenger cars and light-duty trucks which use revised weight specification terminology now used in the corresponding federal procedures;

WHEREAS, the staff has proposed amendments to the Guidelines and to Sections 1960.5 and 2061, Title 13, California Administrative Code, which would extend the existing program to cover 1988 and subsequent model-year vehicles, change the NOx credit withdrawal limits to reflect implementation of the amendments approved by the Board April 24, 1986 related to the 0.4 g/mi NOx standard, revise the test weight specifications to use revised terminology contained in the amendments approved by the Board July 24, 1986, and delete a reference to an assembly-line testing requirement which has been eliminated;

WHEREAS, the California Environmental Quality Act and Board regulations require that an action not be adopted as proposed where it will have significant adverse environmental impacts and alternatives or feasible mitigation measures to the proposed action are available which would substantially reduce or avoid such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code; and

WHEREAS, the Board finds that:

The 1983-1987 model-year program for certification of federally certified light-duty vehicles for sale in California has enabled manufacturers to offer an adequate selection of otherwise unavailable models in California;

Extension of the present program, with the modifications contained in the staff proposal, will assure that manufacturers continue to be able to offer an adequate selection of otherwise unavailable models in California;

It is appropriate and necessary to revise the percentages in the Guidelines of NOx credits available for light-duty vehicles to reflect the amendments related to the 0.4 g/mi NOx standard approved by the Board;

Extension of the present AB 965 program with the proposed modifications is anticipated to result in a cumulative significant adverse environmental impact because of increased emissions of NOx, hydrocarbons, and carbon monoxide;

The measures contained in the program approved herein limit the sale of federally certified vehicles in California to those necessary to satisfy the unavailability problem and mitigate the adverse emissions impact to the maximum extent currently feasible; no additional mitigation measures or alternatives which meet the requirements of AB 965 and would eliminate or substantially further reduce any significant adverse environmental impact are currently available.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves the amendments to Section 1960.5, Title 13, California Administrative Code, as set forth in Attachment A; Section 2061, Title 13, California Administrative Code, as set forth in Attachment B; and "Guidelines for Certification of 1983 and Subsequent Model Year Federally Certified Light-Duty Motor Vehicles for Sale in California," as set forth in Attachment C.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the amendments set forth in Attachments A, B, and C after making them available to the public for a period of 15 days, and upon approval by the Office of Administrative Law of the amendments approved by the Board on April 24, 1986 and July 24, 1986, provided that the Executive Officer shall consider such written comments as may be submitted during the 15-day comment period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED that the Board finds that the regulations with the amendments approved herein, individually and in the aggregate with other California motor vehicle emission regulations, are at least as protective of public health and welfare as comparable federal regulations and are consistent with Section 202(a) of the federal Clean Air Act.

BE IT FURTHER RESOLVED that that the Executive Officer shall forward the amended regulations to the Environmental Protection Agency with a request for confirmation that the amendments are within the scope of an existing waiver, pursuant to Section 209(b)(1) of the Clean Air Act.

I hereby certify that the above is a true and correct copy of Resolution 86-94, as adopted by the Air Resources Board.

Utako Kimura
for Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Amendments to Regulations Regarding Certification of Federally Certified Light-Duty Motor Vehicles for Sale in California

Agenda Item No.: 86-13-3

Public Hearing Date: November 20, 1986

Response Date: January 21, 1987

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item.

The staff report identified a significant adverse environmental effect. The staff anticipates that by the year 2000 the AB 965 regulatory program extended as proposed will result in emission increases of 0.2 ton per day of hydrocarbon, 1.6 tons per day of carbon monoxide, and 1.7 tons per day of oxides of nitrogen statewide. These estimates are based upon projected certification levels and assume that program usage continues at current levels. The calculations and other assumptions for the projections are set forth in Appendix III to the Staff Report.

Response: AB 965 (Health and Safety Code § 43102(b)) mandates the Board to establish a program allowing some new federally certified light-duty vehicle models, otherwise unavailable, to be sold in California where their emissions are offset by new California-certified vehicles with emissions below the applicable standards. The existing program contains a number of elements which to some extent mitigate the potential emission increases. These elements include the credit withdrawal limits and the prohibitions on offsetting among different manufacturers, different vehicle categories, and vehicles powered by different fuels. The Board has been unable to identify any other feasible mitigation measures or available alternatives which would substantially further reduce the adverse environmental impact while at the same time fulfilling the mandate of the Legislature.

Certified: _____
Board Secretary

Date: July 14, 1987

ATTACHMENT A

Amend Section 1960.5, Title 13, California Administrative Code, to read as follows:

1960.5. Certification of 1983 ~~through 1987~~ and Subsequent Model Year Federally Certified Light-Duty Motor Vehicles for Sale in California.

(a) The exhaust emissions from new 1983 ~~through 1987~~ and subsequent model year federally certified passenger cars and light-duty trucks, subject to registration and sold and registered in this state pursuant to Section 43102(b) of the California Health and Safety Code, shall not exceed the applicable federal emissions standards as determined under applicable federal test procedures.

(b) With respect to any new vehicle required to comply with the standards set forth in paragraph (a), the manufacturer's written maintenance instructions for in-use vehicles shall not require scheduled maintenance more frequently than or beyond the scope of maintenance permitted under the test procedures referenced in paragraph (a). Any failure to perform scheduled maintenance shall not excuse an emissions violation unless the failure is related to or causes the violation.

(c) The standards and procedures for certifying in California 1983 ~~through 1987~~ and subsequent model year federally certified light-duty motor vehicles are set forth in "Guidelines for Certification of 1983 ~~through 1987~~ and Subsequent Model Year Federally Certified Light-Duty Motor Vehicles for Sale in California", adopted July 20, 1982, as last amended ~~September 16, 1985~~ [insert amendment date], which is incorporated herein by reference.

NOTE: Authority cited: Sections 39601, 43100 and 43102, Health and Safety Code. Reference: Section 43102, Health and Safety Code.

ATTACHMENT B

Amend Section 2061, Title 13, California Administrative Code, as follows:

2061. Assembly-Line Test Procedures -- 1983 and Subsequent Model Years.

New 1983 and subsequent model year passenger cars, light-duty trucks, and medium-duty vehicles subject to certification and manufactured for sale in California shall be tested in accordance with the "California Assembly-Line Test Procedures for 1983 and Subsequent Model Year Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," adopted November 24, 1981, as last amended August 21, 1984, which is incorporated herein by reference, including federally certified light-duty motor vehicles, except as provided in "Guidelines for Certification of 1983 ~~through 1987~~ and Subsequent Model Year Federally Certified Light-Duty Motor Vehicles for Sale in California", adopted July 20, 1982, as last amended ~~September 16, 1985~~ [insert amendment date], which is incorporated herein by reference.

NOTE: Authority cited: Sections 39515, 39600, 39601 and 43210, Health and Safety Code. Reference: Sections 39002, 39003, 39500, 43101, 43102, 43105, 43210, 43211 and 43212, Health and Safety Code.

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
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ATTACHMENT C

Proposed

State of California
AIR RESOURCES BOARD

GUIDELINES FOR CERTIFICATION OF 1983 ~~THROUGH 1987~~ AND SUBSEQUENT MODEL YEAR FEDERALLY CERTIFIED LIGHT-DUTY MOTOR VEHICLES FOR SALE IN CALIFORNIA

Adopted: July 20, 1982
Amended: September 16, 1983
Amended: December 15, 1983
Amended: September 16, 1985
Amended:

NOTE: These Guidelines are printed to identify proposed changes from the Guidelines as amended September 16, 1985. Language proposed to be added is underlined and language proposed to be deleted is struck out. Headings are underlined in the existing Guidelines and are not new additions. Additions to the original staff proposal accompanying the Staff Report released October 3, 1986 are shown by double underline, and deletions are shown by slashes.

GUIDELINES FOR CERTIFICATION OF 1983 ~~THROUGH 1987~~ AND SUBSEQUENT MODEL YEAR FEDERALLY CERTIFIED LIGHT-DUTY MOTOR VEHICLES FOR SALE IN CALIFORNIA

I. APPLICABILITY

These guidelines adopted pursuant to Section 43102(b) of the California Health and Safety Code are applicable to 1983 ~~through 1987~~ and subsequent model year federally certified light-duty motor vehicles proposed for sale in California. These guidelines are not applicable to medium-duty trucks, motorcycles, heavy-duty engines, heavy-duty vehicles, emergency vehicles, or vehicles with engines having a displacement less than 50 cubic inches.

II. DEFINITIONS

For the purposes of these guidelines:

1. "Light-duty motor vehicle" means a vehicle having a manufacturer's maximum gross vehicle weight rating of under 6,001 pounds (California Health and Safety Code Section 39035).
2. "California vehicle" means a motor vehicle originally certified in California by an Executive Order.
3. ~~"Equivalent inertia weight (EIW)" is defined under subparagraph 86.129-79(a), Title 40, Code of Federal Regulations.~~
3. "Loaded Vehicle Weight (LVW)" has the meaning set forth in subparagraph 86.082(b), Title 40, Code of Federal Regulations, as last amended November 2, 1982.
4. "Federal vehicle" means a motor vehicle originally certified federally by a Certificate of Conformity.

5. "Model" means a unique combination of car line, basic engine, and transmission class, or as defined by a manufacturer with the approval of the Executive Officer.

6. "Car Line" means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roof line, number of doors, seats, or windows, except for station wagons or light-duty trucks. Station wagons and light-duty trucks are considered to be different car lines than passenger cars.

7. "Basic Engine" means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (as distinguished by use of carburetor or fuel injection), and catalyst usage.

8. "Transmission Class" means a group of transmissions having the following common features: basic transmission type (manual, automatic, or semi-automatic), number of forward speeds (e.g., manual four-speed, three-speed automatic, two-speed semi-automatic).

III. CERTIFICATION OF FEDERAL VEHICLES

To receive certification for federal vehicle sales in California, a manufacturer shall:

A. Provide to the Executive Officer evidence of federal certification, and a statement that the model(s) for which certification is requested are not available in California.

B. Provide a warranty on emissions-related parts in accordance with Sections 2035 et seq., Title 13, California Administrative Code, as they apply to vehicles certified under the primary California standards. However, federal vehicles which are offset by California vehicles certified to a 100,000-mile optional standard shall provide a ten-year/ 100,000-mile warranty.

C. Provide: 1) certification emission levels of federal models intended for sale in California, 2) quarterly production reports, by model and engine family, of vehicles intended for sale or sold in California, and 3) other information which the Executive Officer deems necessary to calculate emissions offset credits, emission deficits, or air quality impacts.

D. Label each vehicle on the assembly-line with the statement "conforms to federal regulations and is certified for sale in California" to distinguish federal vehicles certified for sale in California from other federal and California vehicles.

IV. ASSEMBLY-LINE AND ENFORCEMENT TESTING

A. All federal vehicles certified and intended for sale in California shall comply with all provisions of the applicable California Assembly-Line Test Procedures, except that:

1. The Executive Officer, at his or her discretion, may accept quality audit emissions data from other sources in lieu of a 2 percent quality audit of federal vehicle production intended for sale in California.

2. Manufacturers which have projected sales of less than 1,000 federal vehicles per model year in California shall be exempt from the 2 percent quality audit requirement. However, such manufacturers shall submit to the Executive Officer any other similar data which may be available.

3. Data submitted in lieu of 2 percent quality audit data shall be accompanied either by a statement that the data were generated according to California Assembly-Line Test Procedures, or by a description of how the testing and analysis procedures used depart from California Assembly-Line Test Procedures.

4. ~~The Executive Officer, at his or her discretion, may waive the requirement for 100 percent steady-state emissions testing of federal vehicles intended for sale in California in cases where lack of test facilities or other factors would place undue burden on vehicle manufacturers.~~

B. All federal vehicles certified for sale in California shall be subject to the compliance testing requirements of Title 13, California Administrative Code.

V. OFFSETTING PROCEDURE

A. Emissions offsetting shall be limited as follows:

1. By manufacturer. A manufacturer shall not trade, sell, transfer, or in any other manner exchange emissions credits with another manufacturer, except that a manufacturer which supplies engines to a vehicle

manufacturer may also supply offsetting emission credits if the vehicle manufacturer's total production for California is less than 200 units per model year.

2. By vehicle category. Vehicle categories are: (a) passenger cars and (b) light-duty trucks (less than 6,001 pounds gross vehicle weight rating). Emission credits from vehicles in one category shall not offset vehicles in the other category.

3. By fuel type. Offsetting shall be conducted only among vehicles with like fuels (e.g., gasoline to gasoline, diesel to diesel, etc.).

4. By durability option. Federal vehicles which are offset by California vehicles certified to the optional 100,000-mile emissions standards must demonstrate 100,000-mile durability, or the equivalent, subject to the approval of the Executive Officer.

5. By model. No federally certified vehicle shall be certified or sold in California if a comparable California model of the same manufacturer is offered in the same model year.

6. By pollutant. Oxides of nitrogen (NOx) and particulates are the only pollutants which may be offset for passenger cars. Hydrocarbons, carbon monoxide, NOx, and particulates may be offset for light-duty trucks. Particulates may be offset for passenger cars and light-duty trucks only for the 1985 model year.

Evaporative hydrocarbons are not eligible for offsets. Total hydrocarbon data shall be compared directly to non-methane hydrocarbon data for purposes of calculating offsets.

B. Each manufacturer shall submit to the Executive Officer by October 1 of each year, or as soon thereafter as is practicable: (1) an estimate of the emissions credits which it will accrue based upon California certified emissions levels and projected sales of California vehicles; and (2) an estimate of the emissions credits which it will use based upon federal certification emissions levels and estimated sales of federal vehicles in California. These estimates may be changed at any time within the model year, subject to the approval of the Executive Officer. A change shall be deemed approved unless the Executive Officer disapproves the change in writing within 30 days of the Executive Officer's receipt of the change.

C. Within the bounds of Part A, emissions credits that can be accrued by a California certified vehicle shall be the difference between the applicable California standard and the certification emissions level.

$$\text{Estimated Credits} = \sum_{i=1}^{m} \text{Calsales}_i \, (\text{Calstd} - \text{Calcert}_i)$$

Where: m = Number of California engine families certified to a set of California standards (passenger cars, ~~0-3999-pounds-EIW~~ 0-3750 pounds LVW trucks, ~~4000-5999-pounds-EIW~~ 3751-5750 pounds LVW trucks) for a given manufacturer.

Calsales = Manufacturer's projected sales by engine family.

Calstd = Applicable California standard.

Calcert = California engine family certification level listed on the Executive Order for the applicable engine family.

D. Within the bounds of Part A, the emissions required to offset a federal vehicle shall be the difference between the federal certification level and the sales-weighted mean certification level of all California engine families (Calmean) as of February 1 of the previous model year for passenger cars or the appropriate light-duty truck group as applicable. If a new standard is implemented, an estimated Calmean shall be determined at 80 percent of the new standard. The estimated Calmean shall be applicable, for the initial model year under the new standard only.

$$\text{Estimated Withdrawals} = \sum_{j=1}^{n} \text{Fedsales}_{\underline{ij}} \; (\text{Fedcert}_{\underline{ij}} - \text{Calmean})$$

Where:

n = Number of unavailable passenger car and light-duty trucks by model types.

Fedsales = Estimated sales of unavailable federal model types in California for a given model year.

Fedcert = Federal certification level of the engine family containing the unavailable model. Federal certification level shall be taken as the highest level, for each pollutant, of any emission data vehicle in an engine family.

Calmean = Sales weighted mean certification emission level of all California engine families (industry-wide) within the appropriate standards category.

E. The estimates referred to in Parts B, C, and D shall be updated at the end of the model year production period to final estimates using vehicle production data and, to the extent available, assembly-line emissions data. Within 60 days after the end of the model year production period, the manufacturer shall submit final estimates for the model year.

F. For the purposes of withdrawals, the 0 to ~~3,999~~ 3,750 lbs. and ~~4,000~~ 3,751 to ~~5,999~~ 5,750 lbs. ~~EIW~~ LVW groups may be combined for light-duty trucks.

G. Manufacturers shall individually be limited to withdrawing the following percentages of accrued credits for offsetting federal vehicles:

Passenger Car NOx	-	8%	(1983 through 1988 model years)
Passenger Car NOx	-	16%	(1989 model year)
Passenger Car NOx	-	~~21%~~ 26%	(1990 through 1993 model years)
Passenger Car NOx	-	30%	(1994 and subsequent model years)
Passenger Car Particulate	-	11%	(1985 model year only)
Light-Duty Truck HC	-	74%	
Light-Duty Truck CO	-	17%	
Light-Duty Truck NOx	-	39%	(1983 through 1988 model years)
Light-Duty Truck NOx	-	65%	(1989 model year)
Light-Duty Truck NOx	-	82%	(1990 through 1993 model years)
Light-Duty Truck NOx	-	84%	(1994 and subsequent model years)
Light-Duty Truck Particulate	-	45%	(1985 model year only)

H. An emission deficit in the final estimate for a model year caused by misjudging sales of California vehicles shall be carried over and offset in the next model year.

I. A manufacturer with an emission deficit for the same vehicle category for two consecutive model years based on final estimates shall not receive certification under these guidelines for any federal vehicles within that vehicle category produced during a 12-month period commencing 15 days after receipt of written notification from the Executive Officer. The manufacturer shall during the 12-month period offset all emissions deficits accumulated for the vehicle category. The manufacturer shall not receive certification under these guidelines for any federal vehicles within the vehicle category produced after the end of the 12-month period but before all of the accumulated emissions deficits are offset. A manufacturer with an emission deficit existing for the vehicle category after the 12-month period shall be subject to a maximum civil penalty of $500 per vehicle pursuant to Section 43016 of the Health and Safety Code. The number of federal vehicles on which the penalty shall be calculated shall be computed as follows:

$$\text{No. of federal vehicles} = \frac{\text{Emission deficit after the suspension period}}{\text{Fed assy - Calmean}}$$

where Fed assy = federal assembly-line or certification emission level of the engine family containing the unavailable model taken as the mean of the engine family quality audit of the preceding model year.

Calmean = sales weighted mean certification emission level of all California engine families within the appropriate standards taken on the preceding model year.

J. A manufacturer shall be subject to a maximum civil penalty of $5,000 per vehicle pursuant to Section 43154 of the Health and Safety Code under either of the following situations:

   a. Sales of federal vehicles in excess of a manufacturer's final estimate regardless of whether or not a deficit was incurred.

   b. Sales of federal vehicles which under Section V.I. are not entitled to certification under these guidelines.

K. Vehicles with engine family certification emission levels which are equal to or less than the appropriate 'Calmean' value are not eligible for offsetting.

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thru

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Not Used

State of California
AIR RESOURCES BOARD

Resolution 86-98

November 20, 1986

Agenda Item No.: 86-13-4

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, pursuant to Section 41850 of the Health and Safety Code, the Board may regulate, but not prohibit, agricultural burning;

WHEREAS, Section 41856 of the Health and Safety Code authorizes the Board to promulgate guidelines for the regulation and control of agricultural burning in each air basin of the state, and Sections 41857 and 41858 provide that the guidelines shall be based on meteorological data, the nature and volume of materials to be burned and the probable effect of such burning on ambient air quality, and that, in adopting the guidelines, the Board shall consider their economic and technological feasibility;

WHEREAS, the Board has established Agricultural Burning Guidelines in Sections 80100 through 80330, Title 17, California Administrative Code;

WHEREAS, Section 41859 of the Health and Safety Code provides that the Board shall continually review its Agricultural Burning Guidelines;

WHEREAS, wildland vegetation management burning is conducted in California by many public agencies to accomplish a variety of natural resource management objectives such as wildlife habitat improvement, watershed management, and forest improvement, as well as the primary objective of preventing high intensity wildland fires;

WHEREAS, wildland vegetation management burning may be classified and regulated under the existing Agricultural Burning Guidelines as either forest management or range improvement burning, depending on the purposes for which the particular project is conducted;

WHEREAS, the existing forest management and range improvement burning provisions lack flexibility in certain respects to accommodate the sophisticated needs of wildland vegetation management burning and lack sufficient stringency in other respects regarding such burning programs;

WHEREAS, the Board staff has proposed amendments to the Agricultural Burning Guidelines which include definitions of wildland vegetation management burning and prescribed burning, specific requirements for wildland vegetation management burning, and a requirement that districts amend their agricultural burning implementation plans to provide for regulation of wildland vegetation management burning;

WHEREAS, Board staff has developed the proposed amendments in coordination with representatives of numerous interested parties including local air pollution control districts, the California Deparment of Forestry, and the United States Forest Service;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code; and

WHEREAS, the Board finds that:

The proposed amendments to the Agricultural Burning Guidelines set forth in Attachment A will alleviate the need to determine the particular agricultural purpose for which wildland vegetation management burning is conducted and thereby simplify the identification of applicable requirements;

The proposed amendments will impose requirements for wildland vegetation management burning conducted by public agencies which are more closely tailored to the needs and potential problems of such burning;

The proposed amendments will protect air quality without adversely impacting the agricultural economy of the state.

This regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board adopts the amendments to Sections 80100, 80110, 80140 and 80175, Title 17, California Administrative Code, as set forth in Attachment A hereto.

I hereby certify that the above is a true and correct copy of Resolution 86-98, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ATTACHMENT A

Amend Title 17, California Administrative Code, Section 80100 to read as follows:

80100. Definitions

(a) "Agricultural Burning Guidelines" means the provisions of Subchapter 2, Chapter 1, ~~of~~ Part III, Title 17, California Administrative Code.

(b) "Brush treated" means that the material to be burned has been felled, crushed or uprooted with mechanical equipment, has been desiccated with herbicides, or is dead.

(c) "Designated agency" means any agency designated by the Air Resources Board (~~State Board~~ state board) as having authority to issue agricultural burning permits. The U.S. Forest Service and the California Department of Forestry are so designated within their respective areas of jurisdiction.

(d) "Forest management burning" means the use of open fires, as part of a forest management practice, to remove forest debris or for forest management practices which include timber operations, silvicultural practices or forest protection practices.

(e) A "no-burn" day means any day on which agricultural burning is prohibited by the ~~State Board~~ state board or by a district.

(f) "Open burning in agricultural operations in the growing of crops or raising of fowl or animals" means:

(1) The burning in the open of materials produced wholly from operations in the growing and harvesting of crops or raising of fowl or animals for the primary purpose of making a profit, of providing a livelihood, or of conducting agricultural research or instruction by an educational institution.

(2) In connection with operations qualifying under subdivision (1):

(A) The burning of grass and weeds in or adjacent to fields in cultivation or being prepared for cultivation.

(B) The burning of materials not produced wholly from such operations, but which are intimately related to the growing or harvesting of crops and which are used in the field, except as prohibited by district regulations. Examples are trays for drying raisins, date palm protection paper, and fertilizer and pesticide sacks or containers, where the sacks or containers are emptied in the field.

(g) A "permissive-burn" day means any day on which agricultural burning is not prohibited by the ~~State Board~~ state board.

(h) "Range improvement burning" means the use of open fires to remove vegetation for a wildlife, game or livestock habitat or for the initial establishment of an agricultural practice on previously uncultivated land.

(i) "Silviculture" means the establishment, development, care and reproduction of stands of timber.

(j) "Tahoe Basin" means the area, within the State of California, as defined by the California-Nevada Interstate Compact, Article II, Paragraph C, as contained in Section 5976 of the State Water Code.

(k) "Timber operations" means cutting or removal of timber or other forest vegetation.

(l) "Wildland vegetation management burning" means the use of prescribed burning conducted by a public agency, or through a cooperative agreement or contract involving a public agency, to burn land predominantly covered with chaparral (as defined in Title 14, California Administrative Code, Section 1561.1), trees, grass or standing brush.

(m) "Prescribed burning" means the planned application of fire to vegetation on lands selected in advance of such application, where any of the purposes of the burning are specified in the definition of agricultural burning as set forth in Health and Safety Code Section 39011.

NOTE: Authority cited: Sections 39600, 39601, 41856, and 41859, Health and Safety Code. Reference: Sections 39011, ~~39025, 39053,~~ 41853, 41854, 41855, 41856, 41857, 41858, 41859, 41861, 41862 and 41863, Health and Safety Code.

Amend Title 17, California Administrative Code, Section 80110(c) to read as follows:

80110. Permissive-Burn or No-Burn Days

* * * * *

(c) Upon request from a permittee through a designated agency, seven days in advance of a specific range improvement burn, ~~or~~ forest management burn, or wildland vegetation management burn, at any elevation below 6,000 ft. (msl), a permissive-burn or no-burn notice will be issued by the ~~State Board~~ state board up to 48 hours prior to the date scheduled for the burn. Without further request, a daily notice will continue to be issued until a permissive-burn notice is issued.

* * * * *

NOTE: Authority cited: Sections 39600, 39601, 41856, and 41859, Health and Safety Code. Reference: Sections 41855, 41856, 41857, 41858, 41861, and 41862, Health and Safety Code.

Amend Title 17, California Administrative Code, Section 80140 to read as follows:

80140. General

(a) In accordance with Section 41863 of the California Health and Safety Code, each district in the State shall adopt an implementation plan consistent with these Agricultural Burning Guidelines. Each district shall develop its implementation plan in cooperation with the appropriate fire protection agencies having jurisdiction within the district.

(b) Districts that have an approved implementation plan for regulating "agricultural burning" (as defined in the Agricultural Burning Guidelines adopted on June 21, 1972, filed as Administrative Code regulations with the Secretary of State on July 7, 1972) need not submit an implementation plan for regulating open burning in agricultural operations in the growing of crops or raising of fowl or animals, forest management, or range improvement, or used in improvement of land for wildlife and game habitat as defined in these Guidelines. Such approved implementation plans shall remain effective under this subdivision until modified and approved pursuant to subdivision (i) of this section. Districts shall submit modifications to their implementation plans by March 1, 1980, to include provisions for regulating agricultural burning and for disease or pest prevention which conform to the amendments to these Guidelines adopted on October 12, 1979. No later than June 1, 1987, districts shall submit modifications to their implementation plans to conform them to the amendments to these guidelines adopted on [insert date of adoption] or shall notify the executive officer of the state board in writing of their determination that no modifications are necessary.

(c) The form of permit(s) required under subdivision (a) of Section 80120 and the form of information required under subdivision (c) of Section 80120 shall be part of the plan.

(d) Each plan shall specify enforcement procedures.

(e) Each plan shall be submitted to the ~~State Board~~ state board for approval within ten days after adoption by the district.

(f) The ~~State Board~~ state board shall either approve, modify and approve, or reject any plan or modification of such plan submitted. Prior to disapproval or modification of any such plan the ~~State Board~~ state board shall hold a public hearing. Approval of any plan or any part of such plan is hereby delegated to the ~~Executive Officer~~ executive officer of the ~~State Board~~ state board. With respect to modifications submitted or a district determination that no modifications are necessary as a result of the amendments to the Agricultural Burning Guidelines adopted on [insert date of adoption], the executive officer shall approve any plan or modification if the plan as adopted or modified includes provisions in conformity with the amendments, and contains enforcement procedures likely to result in compliance with those provisions.

(g) If the plan or modification of such plan is rejected, or if no timely plan is submitted, or if the plan is economically or technically not feasible, the ~~State Board~~ state board, after a public hearing held in the basin affected, shall adopt an alternative plan.

(h) The approved implementation plan shall be enforced by the district.

(i) After a district implementation plan is approved by the ~~State Board~~ state board, modifications to the plan shall be submitted to the ~~State Board~~ state board for its approval, and shall not be effective until approved.

NOTE: Authority cited: Sections 39600, 39601, 41856 and 41859, Health and Safety Code. Reference: Sections 41856, 41859 and 41863, Health and Safety Code.

Adopt new Title 17, California Administrative Code, Section 80175 to read as follows:

80175. Wildland Vegetation Management Burning

(a) A district with no wildland vegetation management burning within its jurisdiction may request to be exempted from the requirements of this section.

(b) Where an implementation plan for wildland vegetation management burning is required, the plan shall include rules and regulations which:

(1) Apply to all burning which meets the definition of wildland vegetation management burning, regardless of whether such burning also meets another definition in Section 80100 of this subchapter.

(2) Limit the ignition of fires to approved devices.

(3) Regulate the total acreage or tonnage of vegetation that may be burned each day within the district.

(4) Regulate burning or require mitigation when the meteorological conditions could otherwise cause smoke to create or contribute to an exceedance of a state or federal ambient air quality standard or cause a public nuisance.

(5) Require the vegetation to be burned to be free of tires, rubbish, tar paper or construction debris, and reasonably free of dirt and soil.

(6) Require the vegetation to be in a condition which will facilitate combustion and minimize the amount of smoke emitted during combustion.

(7) For projects exceeding a predetermined size or tonnage threshold level, or for projects situated in zones specified by the district, require the following information be provided to the district for review and approval in advance of the proposed burning:

(a) location and specific objectives of the burn project;

(b) acreage or tonnage, type, and arrangement of vegetation to be burned;

(c) directions and distances to nearby sensitive receptor areas;

(d) fuel condition, combustion, and meteorological prescription elements developed for the project;

(e) projected schedule and duration of project ignition, combustion, and burndown;

(f) specifications for monitoring and verifying critical project parameters; and

(g) specifications for disseminating project information.

NOTE: Authority cited: Sections 39600, 39601, 41856 and 41859, Health and Safety Code. Reference: Sections 41856, 41857, 41858, 41859 and 41863, Health and Safety Code.

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Amendments to Agricultural Burning Regulations

Agenda Item No.: 86-13-4

Public Hearing Date: November 20, 1986

Response Date: November 20, 1986

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: _____
Board Secretary

Date: 12/05/86

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : **Air Resources Board**

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-68
86-70
86-71
86-94
86-98
86-99
86-115
87-9
87-61
87-62
87-66
88-1
88-8

State of California
AIR RESOURCES BOARD

Resolution 86-99

November 20, 1986

Agenda Item: 86-13-5

WHEREAS, Section 39601 of the Health and Safety Code authorizes the Air Resources Board ("Board") to adopt standards, rules, and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, Section 39607(d) of the Health and Safety Code requires the Board to adopt test procedures to measure compliance with its nonvehicular emission standards and those of the air pollution control and air quality management districts ("districts");

WHEREAS, the Board has previously adopted Title 17, California Administrative Code, Sections 94100-94130, which establish 30 test methods for determining whether a nonvehicular (stationary) source is in compliance with district emission standards;

WHEREAS, the Board's staff has now developed seven new test methods for determining compliance with district nonvehicular emission standards;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as proposed if feasible alternatives or mitigation measures are available which would substantially reduce such adverse impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of the Administrative Procedure Act (Government Code, Title 2, Division 3, Part 1, Chapter 3.5); and

WHEREAS, the Board finds that:

Adoption of the seven new test methods set forth in Attachment B, and adoption of the regulations set forth in Attachment A incorporating the test methods, are necessary and appropriate to satisfy the requirements of Section 39607(d) of the Health and Safety Code and may simplify the identification, adoption and enforcement of nonvehicular emission standards; and

The adoption of the test methods and regulations set forth in Attachments A and B will have no significant adverse environmental impacts.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves Sections 94131 through 94137, Title 17, California Administrative Code, as set forth in Attachment A hereto, and approves the seven new test methods for determining compliance with district nonvehicular emissions standards set forth in Attachment B.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to adopt the regulatory changes set forth in Attachments A and B, after making them available to the public for a period of 15 days, and with such minor modifications as may be appropriate in light of written comments submitted during this period, provided that the Executive Officer shall present the regulations to the Board for further consideration if he determines that this is warranted in light of the written comments received.

I hereby certify that the above is a true and correct copy of Resolution 86-99, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Adoption of Regulations Regarding Test Methods for Determining Emissions from Nonvehicular Sources

Agenda Item No.: 86-13-5

Public Hearing Date: November 20, 1986

Response Date: December 22, 1986

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: Harold Holmes
Board Secretary

Date: January 13, 1987

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : **Air Resources Board**

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86-98
86-99
86-115
87-9
87-61
87-62
87-66
88-1
88-8

State of California
AIR RESOURCES BOARD

Resolution 86-100

WHEREAS, J. Gordon Kennedy has served with distinction as a member of the Air Resources Board from February 1983 through December 1986; and

WHEREAS, as an involved citizen and Madera County Supervisor, and as a long time member of the San Joaquin Valley Basinwide Control Council, he has outstanding leadership abilities which have enabled him to make valuable contributions to the activities of the Board; and

WHEREAS, his background and interest in agriculture have played an important role in fostering communication between the Board and the agricultural community and in ensuring full consideration of agricultural concerns in Board actions; and

WHEREAS, in addition to his contributions at regular Board meetings, he has served with dedication and diligence as Chairman of the Agricultural Advisory Committee, and as a member of the Committee on Visibility, the Legislative Advisory Committee, and the San Joaquin Valley Air Study Committee and has played an active and valuable role in the development of a San Joaquin Valley-wide air quality modeling study; and

WHEREAS, he has brought to the Board's deliberations a thorough statewide perspective as well as an enhanced recognition of issues particular to the San Joaquin Valley; and

WHEREAS, as Chairman of the Agricultural Advisory Committee, he has advised the Board on agricultural research and extended the agricultural communities' understanding of the Board's research program; and

WHEREAS, his intelligence, his objective approach to a problem, and his thorough grasp of issues have won for him the respect of his fellow Board members, the Board staff, and members of the public; and

WHEREAS, his kindness and congeniality will be remembered by his fellow Board members and the Board staff.

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board extends its deepest appreciation to Supervisor Kennedy and expresses its thanks for his significant contribution to California's progress towards clean air.

Jananne Sharpless, Chairwoman

George Bailey, Member

John S. Lagarias, Member

Eugene Boston, M.D., Member

Harriett M. Wieder, Member

Roberta H. Hughan, Member

Andrew Wortman, Ph.D., Member

Betty S. Ichikawa, Member

State of California
AIR RESOURCES BOARD

Resolution 86-100

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WHEREAS, his background and interest in agriculture have played an important role in fostering communication between the Board and the agricultural community and in ensuring full consideration of agricultural concerns in Board actions; and

WHEREAS, in addition to his contributions at regular Board meetings, he has served with dedication and diligence as Chairman of the Agricultural Advisory Committee, and as a member of the Committee on Visibility, the Legislative Advisory Committee, and the San Joaquin Valley Air Study Committee and has played an active and valuable role in the development of a San Joaquin Valley-wide air quality modeling study; and

WHEREAS, he has brought to the Board's deliberations a thorough statewide perspective as well as an enhanced recognition of issues particular to the San Joaquin Valley; and

WHEREAS, as Chairman of the Agricultural Advisory Committee, he has advised the Board on agricultural research and extended the agricultural communities' understanding of the Board's research program; and

WHEREAS, his intelligence, his objective approach to a problem, and his thorough grasp of issues have won for him the respect of his fellow Board members, the Board staff, and members of the public; and

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NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board extends its deepest appreciation to Supervisor Kennedy and expresses its thanks for his significant contribution to California's progress towards clean air.

Jananne Sharpless, Chairwoman

George Bailey, Member

John S. Lagarias, Member

Eugene Boston, M.D., Member

Harriett M. Wieder, Member

Roberta H. Hughan, Member

Andrew Wortman, Ph.D., Member

Betty S. Ichikawa, Member

State of California
AIR RESOURCES BOARD

Resolution 86-101
November 20, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 133-19, entitled "Acidic Aerosol Size Distributions During SCAQS," has been submitted by California Public Health Foundation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 133-19, entitled "Acidic Aerosol Size Distributions During SCAQS," has been submitted by California Public Health Foundation, for a total amount not to exceed $164,044.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 133-19, entitled "Acidic Aerosol Size Distributions During SCAQS," submitted by California Public Health Foundation for a total amount not to exceed $164,044.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $164,044.

I hereby certify that the above is a true and correct copy of Resolution 86-101, as adopted by the Air Resources Board

Harold Holmes, Board Secretary

ITEM NO.: 86-13-6(b) 1
DATE: November 20, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 133-19 entitled "Acidic Aerosol Size Distributions During SCAQS."

RECOMMENDATION: Adopt Resolution 86-101 approving Proposal No. 133-19 for funding in an amount not to exceed $164,044.

SUMMARY:

The purpose of this study is to provide data on size-resolved chemical composition of aerosols during the summer portion of the Southern California Air Quality Study (SCAQS). The overall goal of SCAQS is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin that can be used to test, evaluate, and improve elements of air quality simulation models for oxidants, PM_{10}, fine particles, toxic air contaminants and acidic species.

Gas and Aerosol phase computer models require, for their validation, spatially and temporally resolved ambient measurements of aerosols, including information on inorganic ions (nitrate, sulfate, chloride, ammonium, potassium, and sodium). To provide these data, the proponent would use the nine-stage Berner cascade impactor, which was demonstrated successfully during the ARB-sponsored Nitrogen Species Measurement Methods Comparison Study held in Claremont in September 1985.

The Contractor will measure the particle size distribution of major inorganic ions during the summer intensive study period of SCAQS, approximately 6 weeks (12 sampling days) beginning in June, 1987. The Berner impactors will be operated at three stations including the two type "A" (intensive) stations, and a mobile station which would be situated in an upwind area. In addition to the above measurements, the contractor would analyze ten percent of the samples collected for calcium and magnesium ions, and formic and acetic acids.

The research contractor is the California Public Health Foundation and the Principal Investigator is Dr. Walter John.

BUDGET SUMMARY

California Public Health Foundation

"Acidic Aerosol Size Distributions During SCAQS"

BUDGET ITEMS:

Salaries	$70,678	
Benefits	20,477	
Supplies[1]	11,600	
Travel	10,560	
Equipment[2]	18,501	
TOTAL, Direct Costs		$131,816
TOTAL, Indirect Costs		32,228
TOTAL PROJECT COST		$164,044

1/ Includes fabrication of three wind shields, three denuders, and three sampling stands.

2/ Includes two eight-stage Berner Impactors ($17,006).

State of California
AIR RESOURCES BOARD

Resolution 86-102
November 20, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an augmentation proposal, Number 018-3(b), entitled "Snow Deposition, Melt, Runoff and Chemistry in a Small Alpine Watershed, Emerald Lake Basin, Sequoia National Park," has been submitted by the University of California, Santa Barbara;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 018-3(b), entitled "Snow Deposition, Melt, Runoff and Chemistry in a Small Alpine Watershed, Emerald Lake Basin, Sequoia National Park," submitted by the University of California, Santa Barbara, for a total amount not to exceed $32,183.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 018-3(b), entitled "Snow Deposition, Melt, Runoff and Chemistry in a Small Alpine Watershed, Emerald Lake Basin, Sequoia National Park," submitted by the University of California, Santa Barbara for a total amount not to exceed $32,183.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $32,183.

I hereby certify that the above is a true and correct copy of Resolution 86-102, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-13-6(b) 2
DATE: November 20, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 018-3(b) entitled "Snow Deposition, Melt, Runoff and Chemistry in a Small Alpine Watershed, Emerald Lake Basin, Sequoia National Park."

RECOMMENDATION: Adopt Resolution 86-102 approving Proposal No. 018-3(b) for funding in an amount not to exceed $32,183.

SUMMARY: As part of the Acid Deposition Research and Monitoring Program, snow deposition and snowmelt runoff have been studied at a representative, high-elevation watershed, Emerald Lake Basin. The proponents have carried out this study of snow deposition and chemistry during two field seasons, winter 1984-85 and 1985-86. This study continuation will allow the researchers to collect snow samples and conduct experiments at the Emerald Lake Watershed during winter 1986-87 to help with the estimation of atmospheric loading to the Basin during the winter period, when more than 90% of the total volume of deposition occurs.

The work to be continued includes: routine sampling of snowfall and snowpack at a number of locations in the Basin; collection of data on meteorological parameters; installation of equipment and conducting of snow-event fractionation experiments; and planning from tracer experiments during snowmelt.

This work on snow-processes and chemistry is crucial to an understanding of the chemistry of dry and wet deposition to sensitive, high-elevation areas of California. These data will also be useful in estimating timing, magnitude and acidity of snowmelt runoff in the spring when biological populations are particularly vulnerable.

The research contractor is the University of California at Santa Barbara, and the principal investigators are Drs. Jeffrey Dozier and John Melack.

BUDGET SUMMARY

University of California, Santa Barbara

"Snow Deposition, Melt, Runoff and Chemistry in a Small Alpine Watershed, Emerald Lake Basin, Sequoia National Park,

BUDGET ITEMS:

Salaries	$14,320	
Benefits	2,087	
Supplies	4,000	
Other Costs*	5,850	
Travel	3,000	
TOTAL, Direct Costs		$29,257
TOTAL, Indirect Costs		2,926
TOTAL PROJECT COST		$32,183

* Includes computer time, satellite data and aerial overflights.

State of California
AIR RESOURCES BOARD

Resolution 86-103
November 20, 1986

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 136-19, entitled "Effects of Acid Fog and Ozone on Conifers," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 136-19, entitled "Effects of Acid Fog and Ozone on Conifers," submitted by the University of California, Riverside for a total amount not to exceed $88,480.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

> Proposal Number 136-19, entitled "Effects of Acid Fog and Ozone on Conifers," submitted by the University of California, Riverside for a total amount not to exceed $88,480.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $88,480

I hereby certify that the above is a true and correct copy of Resolution 86-103, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-13-6(b) 3
DATE: November 20, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 136-19 entitled "Effects of Acid Fog and Ozone on Conifers."

RECOMMENDATION: Adopt Resolution 86-103 approving Proposal No. 136-19 for funding in an amount not to exceed $88,480.

SUMMARY:

The objective of this proposal is to identify the metabolic basis for the response of coniferous trees to acid fog, and to determine whether acid fog exposure predisposes trees to ozone injury and growth reduction.

The Kapiloff Act requires the Board to conduct a comprehensive research program into the effects of acid deposition, including determination of the effects of acid deposition, in its various forms, upon forest plants. In addition, the Act requires the Board to determine dose response functions to assess economic effects of damage to forest plants.

The experiments proposed here for pine seedlings should provide valuable information on the effects of acid deposition for an important forest species. The experiments are intended to simulate spring and summer ambient air conditions in the South Coast Air Basin. The plants, Ponderosa pine and Monterey pine, will be exposed to acidic fog for up to eleven weeks during spring and then exposed to ambient ozone levels during July through September. During the exposures, appropriate physiological measurements will be made and environmental conditions monitored. These data will then be analyzed to assess the degree of plant response.

The research contractor is the Statewide Air Pollution Research Center of the University of California at Riverside, and the principal investigators are Drs. Andrzej Bytnerowicz and David Olszyk.

BUDGET SUMMARY

University of California, Riverside

"Effects of Acid Fog and Ozone on Conifers"

BUDGET ITEMS:

Salaries	$53,759	
Benefits	13,958	
Supplies*	9,436	
Other Costs	2,085	
Travel	1,517	
TOTAL, Direct Costs		$80,755
TOTAL, Indirect Costs		7,725
TOTAL PROJECT COST		$88,480

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* Includes $3000 for fabrication of fogging enclosures and $4000 for electric power.

State of California
AIR RESOURCES BOARD

Resolution 86-104

November 20, 1986

Agenda Item Nos: 86-13-1
86-13-2

WHEREAS, on August 22, 1986, the Air Resources Board ("ARB" or the "Board") adopted Resolution 86-76 amending the 1986 Kern County Plan adopted by the Kern County Board on March 31, 1986;

WHEREAS, the Resolution provided for a committee of the Board to seek new information on specified issues regarding the 1986 Kern County Plan as amended by the Board, and that committee has made several recommendations to the Board; and

WHEREAS, the Western Oil and Gas Association (WOGA) filed with the Board a petition for reconsideration of Resolution 86-76, dated October 14, 1986, and WOGA has withdrawn its petition, without prejudice, based on this resolution.

NOW, THEREFORE, BE IT RESOLVED that the Executive Officer shall forward the 1986 Kern County Plan as amended by the Board August 22, 1986 to the Environmental Protection Agency (EPA).

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to schedule a hearing in February 1987 for the purpose of considering amendments to the Plan relating to the oxides of nitrogen (NOx) controls on the West Side.

BE IT FURTHER RESOLVED that ARB requests EPA to withhold final action to approve or disapprove the Plan as amended and to hold the public comment period open until March 31, 1987, and that the ARB's submission to EPA of the 1986 Kern County Plan as amended by the ARB is based on ARB's understanding that EPA concurs with this request.

BE IT FURTHER RESOLVED that the Board reaffirms its commitment that the emission limits specified in Resolution 86-76, e.g., 0.14 lb/MM Btu NOx for steam generators, be considered when the Kern County Board conducts hearings to consider the adoption of the specified rules. In determining the emission limits specified in the various rules as applied to individual generators, the Kern County and state Boards will also take into consideration what limits are technologically feasible and economically reasonable and thereby constitute "reasonable available control technology."

BE IT FURTHER RESOLVED that the Board supports continued technical analysis to generate new information on the effects of hydrocarbon and NOx controls on ozone in Central Kern and is willing to consider expeditiously such new information and, if appropriate, amend the Plan.

I hereby certify that the above is a true and correct copy of Resolution 86-104, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

State of California

Memorandum

To : Gordon Van Vleck
Secretary
Resources Agency

Date : March 12, 1987

Subject: Filing of Notice of Decisions of the Air Resources Board

From : Harold Holmes
Board Secretary
Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
86-76
86-104
87-17

State of California
AIR RESOURCES BOARD

Resolution 86-105
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1462-130, entitled "Documentation of Ozone as the Primary Phytotoxic Agent in Photochemical "Smog"," has been submitted by the University of California, Riverside;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1462-130, entitled "Documentation of Ozone as the Primary Phototoxic Agent in Photochemical Oxidant "Smog"," submitted by the University of California, Riverside for a total amount not to exceed $66,202.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the and approves the following:

> Proposal Number 1462-130, entitled "Documentation of Ozone as the Primary Phototoxic Agent in Photochemical Oxidant "Smog"," submitted by the University of California, Riverside for a total amount not to exceed $66,202.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $66,202.

I hereby certify that the above is a true and correct copy of Resolution 86-105, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 1
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1462-130 entitled "Documentation of Ozone as the Primary Phytotoxic Agent in Photochemical Oxidant "Smog"."

RECOMMENDATION: Adopt Resolution 86-105 approving Proposal No. 1462-130 for funding in an amount not to exceed $66,202.

SUMMARY: The objective of this study is to compare the response of plants exposed to ambient oxidants with the response of plants exposed to experimentally-generated ozone. Both types of atmospheres have been used experimentally, but it is not clear whether results obtained with experimentally generated ozone are equivalent to those resulting from ambient oxidant exposure. In this study the investigator will expose alfalfa to either ambient Riverside oxidants, or to filtered air to which the ambient concentration of pure ozone has been added. Physiological responses, growth, yield, and foliar injury will be measured. The investigator is Dr. David M. Olszyk.

The results of this study will help determine any significant differences in response of plants to ambient and to experimental atmospheres. Any important differences would need to be considered in reviewing scientific research used to support regulatory action. A finding of no important differences would provide support for present estimates of ozone effects.

BUDGET SUMMARY

University of California, Riverside

"Documentation of Ozone as the Primary Phototoxic Agent in Photochemical Oxidant "Smog"

BUDGET ITEMS:

Salaries	$34,595	
Benefits	9,544	
Equipment*	4,000	
Supplies	150	
Other Costs	2,900	
Travel	1,358	
TOTAL, Direct Costs		$60,547
TOTAL, Indirect Costs		5,655
TOTAL PROJECT COST		$66,202

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* Four open top field chambers and refurbishing of blower boxes.

State of California
AIR RESOURCES BOARD

Resolution 86-106
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1467-130, entitled "The Effects of Present and Potential Air Pollution on Important San Joaquin Valley Crops: Grapes, Tomatoes, and Stone Fruits," has been submitted by the University of California, Riverside;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1467-130, entitled "The Effects of Present and Potential Air Pollution on Important San Joaquin Valley Crops: Grapes, Tomatoes, and Stone Fruits," submitted by the University of California, Riverside for a total amount not to exceed $75,871.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the and approves the following:

> Proposal Number 1467-130, entitled "The Effects of Present and Potential Air Pollution on Important San Joaquin Valley Crops: Grapes, Tomatoes, and Stone Fruits," submitted by the University of California, Riverside for a total amount not to exceed $75,871.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $75,871.

I hereby certify that the above is a true and correct copy of Resolution 86-106, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 2
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1467-130 entitled "The Effects of Present and Potential Air Pollution on Important San Joaquin Valley Crops: Grapes, Tomatoes, and Stone Fruits."

RECOMMENDATION: Adopt Resolution 86-106 approving Proposal No. 1467-130 for funding in an amount not to exceed $75,871.

SUMMARY: This study will address two areas of research. The first portion of this study will extend for an additional year a study now in progress on the growth, yield and quality of Thompson Seedless grapes ambient oxidants. A portion of that study, examining effects of sulfur dioxide on grapes will be discontinued, and a new study, under a separate contract, will be initiated to examine the effect ambient oxidants on grape physiology. This experiment will provide information useful in estimating losses in grape yields due to exposure to ambient oxidants under field conditions.

The second portion of the study is intended to determine if modification of fertilization levels for nitrogen, phosphorus and potassium can alter crop plant sensitivity to air pollution. This experiment would be conducted with ozone sensitive processing tomatoes. Four levels of oxidant, three levels of nitrogen, and two each of phosphorus and potassium will be used. The investigator will measure vegetative growth, flowering and fruit production of the tomatoes. The results of this study will indicate whether changing the amounts of fertilizers applied to crops can provide a practical means of reducing yield losses caused by oxidant exposure.

The investigator will be Dr. Robert F. Brewer of the University of California, Riverside.

B U D G E T S U M M A R Y

University of California, Riverside

"The Effects of Present and Potential Air Pollution on Important San Joaquin Valley Crops: Grapes, Tomatoes, and Stone Fruits"

BUDGET ITEMS:

Salaries	$40,254		
Benefits	11,439		
Supplies	9,600		
Other Costs	5,806		
Travel	1,875		
TOTAL, Direct Costs			$68,974
TOTAL, Indirect Costs			6,897
		TOTAL PROJECT COST	$75,871

State of California
AIR RESOURCES BOARD

Resolution 86-107
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1480-130, entitled "The Effects of Air Pollutants on Photosynthesis, Vegetative Growth and Development of Grape Vines in the San Joaquin Valley of California," has been submitted by the University of California, Daivs;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1480-130, entitled "The Effects of Air Pollutants on Photosynthesis, Vegetative Growth and Development of Grape Vines in the San Joaquin Valley of California," submitted by the University of California, Davis for a total amount not to exceed $39,416.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1480-130, entitled "The Effects of Air Pollutants on Photosynthesis, Vegetative Growth and Development of Grape Vines in the San Joaquin Valley of California," submitted by the University of California, Davis for a total amount not to exceed $39,416.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $39,416.

I hereby certify that the above is a true and correct copy of Resolution 86-107, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 3
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1480-130 entitled "The Effects of Air Pollutants on Photosynthesis, Vegetative Growth and Development of Grape Vines in the San Joaquin Valley of California."

RECOMMENDATION: Adopt Resolution 86-107 approving Proposal No. 1480-130 for funding in an amount not to exceed $39,416.

SUMMARY: Studies have shown that Thompson Seedles grapes and processing tomatoes are subject to significant losses in yield as a result of exposure to ambient air pollution in the San Joaquin Valley. This study will examine the effects of air pollution in the physiology and development of Thompson Seedless and five other grape varities and on processing tomatoes. The investigator will use established vines to study the response to air pollution of Thompson Seedless grapes, and rooted cutting of five other varieties for comparative studies to assess varietal differences in sensitivity to air pollutants. Grapes and tomato plants will be exposed to several levels of oxidant air pollutants in open top field chambers. The investigator will measure differences in growth, yield, physiological response, and plant biochemistry of plants exposed to different oxidant pollutant levels. The resulting data will be incorporated into mathematical models which may be used to improve estimates of yield losses caused by pollutant exposure.

The principal investigator will be Dr. Larry Williams of the University of California, Davis.

BUDGET SUMMARY

University of California, Davis

"The Effects of Air Pollutants on Photosynthesis, Vegetative Growth, and Development of Grape Vines in the San Joaquin Valley of California"

BUDGET ITEMS:

Salaries	$26,123	
Benefits	7,210	
Supplies	1,700	
Other Costs	600	
Travel	200	
TOTAL, Direct Costs		$35,833
TOTAL, Indirect Costs		3,583
	TOTAL PROJECT COST	$39,416

State of California
AIR RESOURCES BOARD

Resolution 86-108
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1482-130, entitled "Twenty-one Day Exposure to Mixed Air Pollutants: Effects on Lung Airways and Macrophages," has been submitted by the University of California, Irvine;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1482-130, entitled "Twenty-one Day Exposure to Mixed Air Pollutants: Effects on Lung Airways and Macrophages," submitted by the University of California, Irvine for a total amount not to exceed $65,427.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1482-130, entitled "Twenty-one Day Exposure to Mixed Air Pollutants: Effects on Lung Airways and Macrophages," submitted by the University of California, Irvine for a total amount not to exceed $65,427.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $65,427.

I hereby certify that the above is a true and correct copy of Resolution 86-108, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 4
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1482-130 entitled "Twenty-one Day Exposure to Mixed Air Pollutants: Effects on Lung Airways and Macrophages."

RECOMMENDATION: Adopt Resolution 86-108 approving Proposal No. 1482-130 for funding in an amount not to exceed $65,427.

SUMMARY: This proposal would supplement an ongoing project which is being funded by the Electric Power Research Institute (EPRI). The objective of the study is to determine the effects of exposing the lungs of laboratory rats to a complex mixture of air pollutants for several weeks. The composition of the test atmosphere is based on air quality data obtained from Lennox, California. The proposed work will: 1) add two biological measurements that are thought to be more sensitive than those used in the EPRI study; and 2) allow for a more realistic simulation of exposure to ambient air by exposing rats to a less concentrated atmosphere than used in the current EPRI project. The results of this study will provide information about the effect on the lung of prolonged exposure to an atmosphere that simulates polluted ambient air.

The principal investigator will be Dr. Robert Phalen of the University of California, Irvine.

BUDGET SUMMARY

University of California, Irvine

"Twenty-one Day Exposure to Mixed Air Pollutants:
Effects on Lung Airways and Macrophages"

BUDGET ITEMS:

Salaries	$30,990	
Benefits	8,616	
Supplies	11,000	
Other Costs	-0-	
Travel	-0-	
Equipment *	8,000	
Consultant Costs	1,600	
TOTAL, Direct Costs		$60,206
TOTAL, Indirect Costs		5,221
	TOTAL PROJECT COST	$65,427

* Inverted - Stage Microscope $8,000

State of California
AIR RESOURCES BOARD

Resolution 86-109
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1484-130, entitled "Pilot Investigation of Indoor-Outdoor and Personal PM_{10} and Associated Ionic Compounds and Mutagenic Activity," has been submitted by the University of California, Irvine;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1484-130, entitled "Pilot Investigation of Indoor-Outdoor and Personal PM_{10} and Associated Ionic Compounds and Mutagenic Activity," submitted by the University of California, Irvine for a total amount not to exceed $53,509.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1484-130, entitled "Pilot Investigation of Indoor-Outdoor and Personal PM_{10} and Associated Ionic Compounds and Mutagenic Activity," submitted by the University of California, Irvine for a total amount not to exceed $53,509.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $53,509.

I hereby certify that the above is a true and correct copy of Resolution 86-109, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 5
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1484-130 entitled "Pilot Investigation of Indoor-Outdoor and Personal PM_{10} and Associated Ionic Compounds and Mutagenic Activity."

RECOMMENDATION: Adopt Resolution 86-109 approving Proposal No. 1484-1301 for funding in an amount not to exceed $53,509.

SUMMARY: The purpose of this pilot study is to evaluate methods of measuring personal exposure to PM_{10} and its constituent ionic species. Studies have shown that ambient monitors may not accurately measure the amount of PM_{10} to which people are actually exposed. Accurate estimates of exposure are necessary to predict the risk posed to public health, but it is not presently possible to make such estimates. The proposed study includes field testing of asthmatics using personal PM_{10} monitors. The results of this pilot study will be used to design future larger scale studies to provide information that would allow for a more accurate estimation of Californians' exposure to PM_{10} and to provide additional information relevant to future reviews of the State PM_{10} standard.

The principal investigator will be Dr. Steven Colome of the University of California, Irvine

BUDGET SUMMARY

University of California, Irvine

"Pilot Investigation of Indoor-Outdoor and Personal PM_{10} and Associated Ionic Compounds and Mutagenic Activity"

BUDGET ITEMS:

Salaries	$15,931	
Benefits	2,330	
Supplies	6,058	
Other Costs*	24,412	
Travel	1,178	
Equipment**	700	
TOTAL, Direct Costs		$50,609
TOTAL, Indirect Costs		2,900
	TOTAL PROJECT COST	$53,509

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* U. C. Davis, Mutagenicity testing $20,912
Nicotine analysis 2,000
Aeroallergen characterization 1,500
$24,412

** 2 Burkard personal aeroallergen volumetric samplers at $350 each

State of California
AIR RESOURCES BOARD

Resolution 86-110
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1479-130, entitled "Incidence of Respiratory Symptoms and Chronic Diseases in a Nonsmoking Population as a Function of Long Term Cumulative Exposure to Ambient Air Pollutants (AHSMOG Follow-up Study)," has been submitted by Loma Linda University;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1479-130, entitled "Incidence of Respiratory Symptoms and Chronic Diseases in a Nonsmoking Population as a Function of Long Term Cumulative Exposure to Ambient Air Pollutants (AHSMOG Follow-up Study)," submitted by Loma Linda University for a total amount not to exceed $254,795.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1479-130, entitled "Incidence of Respiratory Symptoms and Chronic Diseases in a Nonsmoking Population as a Function of Long Term Cumulative Exposure to Ambient Air Pollutants (AHSMOG Follow-up Study)," submitted by Loma Linda University for a total amount not to exceed $254,795.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $254,795.

I hereby certify that the above is a true and correct copy of Resolution 86-110, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 6
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1479-130 entitled "Incidence of Respiratory Symptoms and Chronic Diseases in a Nonsmoking Population as a Function of Long Term Cumulative Exposure to Ambient Air Pollutants (AHSMOG Follow-up Study)."

RECOMMENDATION: Adopt Resolution 86-110 approving Proposal No. 1479-130 for funding in an amount not to exceed $254,795.

SUMMARY: There have been only two major studies of effects of chronic exposure on California populations. One of these two studies was the AHSMOG study, which this proposal would extend. Ten years ago the AHSMOG study surveyed a sample of 7500 non-smokers who had resided at least ten years in their neighborhoods, in which average ambient pollution concentration had been much different. The survey determined the incidence and severity of chronic obstructive pulmonary disease (COPD) and the presence or absence of factors potentially influencing it. Analysis of these data, which avoid the confounding effect of cigarette smoking, showed that greater exposure to high ozone and suspended particle concentrations was associated with a significantly higher relative risk of COPD.

This proposed extension of the AHSMOG project would again survey the sample by mail and telephone to collect another ten years of residence history, to determine the incidence and severity of COPD, and to collect relevant lifestyle and exposure information by means of a very detailed questionnaire. Updated estimates of exposure to ambient pollutants would be computed. The project would then perform a very extensive statistical analysis of these data to ascertain if exposure to pollutants and health effects are again associated. Analyses would include additional health endpoints not obtained in the original AHSMOG study -- incidence of cancer and heart disease, mortality from these two causes, and overall mortality. A subcontract would obtain airport visibility data; this data should provide the best surrogate for inhalable particle concentrations, which have not been monitored until recently. Staff of the Environmental Protection Agency who have successfully used visibility data in epidemiological studies will assist with obtaining and using these visibility data.

Funds reported will cover only one year of the two year effort. The project is cost-effective because it would again survey a previously obtained sample and use health effect data obtained by other projects. About half the cost of the study is to conduct the survey. The other half is to prepare the data for processing and to perform the statistical analyses.

Complex and time-consuming epidemiological studies provide the only direct method of observing how chronic exposure to air pollution affects human health. This information is needed to improve the basis of setting air quality standards.

The principal investigator will be Dr. David Abbey of the Loma Linda University.

BUDGET SUMMARY

Loma Linda University

"Incidence of Respiratory Symptoms and Chronic Diseases in a Nonsmoking Population as a Function of Long Term Cumulative Exposure to Ambient Air Pollutants (AHSMOG Follow-up Study)"

December 18, 1986

BUDGET ITEMS:

Salaries	$94,750	
Benefits	28,425	
Supplies	23,268	
Equipment	1,632	
Three file cabinets		
Other Costs	19,000	
Consultant	3,000	
Subcontract*	24,000	
Travel	1,307	
TOTAL, Direct Costs		$195,382
TOTAL, Indirect Costs		59,413
	TOTAL PROJECT COST	$254,795

* To add airport visibility data to the data base.

State of California
AIR RESOURCES BOARD

Resolution 86-111
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1485-130, entitled "Southern California Air Quality Study - Hydrocarbon Speciation at Type B Stations," has been submitted by Biospherics Corporation;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1485-130, entitled "Southern California Air Quality Study - Hydrocarbon Speciation at Type B Stations," submitted by Biospherics Corporation for a total amount not to exceed $140,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1485-130, entitled "Southern California Air Quality Study - Hydrocarbon Speciation at Type B Stations," submitted by Biospherics Corporation for a total amount not to exceed $140,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $140,000.

I hereby certify that the above is a true and correct copy of Resolution 86-111, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b)
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1485-130 entitled "Southern California Air Quality Study - Hydrocarbon Speciation at Type B Stations."

RECOMMENDATION: Adopt Resolution 86-111 approving Proposal No. 1485-130 for funding in an amount not to exceed $140,000.

SUMMARY: The Southern California Air Quality Study is a multi-year, integrated air quality study whose overall goal is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin. This data base will be used to test, evaluate and improve elements of air quality simulation models for oxidants, PM_{10}, fine particles, toxic air contaminants and acidic species. The study is proposed to take place in the South Coast Air Basin during two intensive study periods during the summer of 1987 for twelve study days and during the fall-winter of 1987 for seven study days. The field study will be conducted primarily at existing SCAQMD air quality monitoring stations.

Speciation of gas phase hydrocarbons at the Class B station during the Southern California Air Quality Study has been specified in the SCAQS program plan. Measurement of this pollutant class is needed in order to study the relationships between hydrocarbons and nitrogen oxides in the formation of ozone, which is the most serious air pollution problem in Los Angeles.

The contractor will analyze collected samples for CH_4, CO and C_2-C_{10} hydrocarbons and several halocarbon compounds. These results will be submitted to ARB and will become part of the SCAQS data set.

The principal investigator will be Dr. Rei Rasmussen of the Biospherics Corporation.

BUDGET SUMMARY

Biospherics Corporation

"Southern California Air Quality Study -
Hydrocarbon Speciation at Type B Stations"

BUDGET ITEMS:

Salaries	$ 1,500		
Hydrocarbon Speciation Measurements	103,500	(690 samples @ $150/sample)	
Canister use fee	22,900		
Travel	1,200		
Equipment Rental	5,600		
Postage for Shipping Canisters	5,300		
TOTAL, Direct Costs			$140,000
TOTAL, Indirect Costs			-0-
	TOTAL PROJECT COST		$140,000

State of California
AIR RESOURCES BOARD

Resolution 86-112
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, a solicited research proposal, Number 1487-130, entitled "Southern California Air Quality Study (SCAQS) - Quality Assurance," has been submitted by Environmental Research and Technology;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Reseach Screening Committee has reviewed and recommends for funding:

> Proposal Number 1487-130, entitled "Southern California Air Quality Study (SCAQS) - Quality Assurance," submitted by Environmental Research and Technology for a total amount not to exceed $63,085.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1487-130, entitled "Southern California Air Quality Study (SCAQS) - Quality Assurance," submitted by Environmental Research and Technology for a total amount not to exceed $63,085.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $63,085.

I hereby certify that the above is a true and correct copy of Resolution 86-112, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 8
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1487-130 entitled "Southern California Air Quality Study (SCAQS) - Quality Assurance."

RECOMMENDATION: Adopt Resolution 86-112 approving Proposal No. 1487-130 for funding in an amount not to exceed $63,085.

SUMMARY: The Southern California Air Quality Study is a multi-year, integrated air quality study whose overall goal is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin. This data base will be used to test, evaluate and improve elements of air quality simulation models for oxidants, PM_{10}, fine particles, toxic air contaminants and acidic species. The study is proposed to take place in the South Coast Air Basin during two intensive study periods for approximately six weeks during the summer of 1987 for twelve study days and during the fall-winter of 1987 for seven study days. The field study will be conducted primarily at existing SCAQMD air quality monitoring stations.

The objective of this project is to design a quality assurance (Q/A) support program for the SCAQS study and to implement part of that program. EPA and other SCAQS sponsors will also contribute to the Q/A program. Quality assurance is the complementary part of the measurement process which provides estimates of the precision, accuracy, and validity of the data base, and guarantees that these attributes are held within acceptable limits. The function of the quality assurance manager is to ensure that the final program design contains adequate quality control procedures and adequate external checks to assure that the data obtained will be suitable for its intended use. A quality assurance program will be impelemented for all repetitive measurements for which standard operating procedures can be developed.

The principal investigator will be Mr. John Collins of Environmental Research and Technology, Inc.,

BUDGET SUMMARY

Environmental Research and Technology

"Southern California Air Quality Study (SCAQS) - Quality Assurance"

BUDGET ITEMS:

Salaries	$18,134	
Supplies	$ 300	
Travel	$ 2,060	
TOTAL, Direct Costs		$20,494
TOTAL, Indirect Costs*		42,591
	TOTAL PROJECT COST	$63,085

*	Direct labor overhead	136%
	General and Administrative Costs	27%
	Fee	10%

State of California
AIR RESOURCES BOARD

Resolution 86-113
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an augmentation proposal Number 1419-126(A), entitled "Comparison of Indoor Toxic Air Pollutant Levels in Several Southern California Communities," has been submitted by Research Triangle Institute to the Air Resources Board; and;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1419-126(A) submitted by Research Triangle Institute for a total amount not to exceed $12,080.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the and approves the following:

> Proposal Number 1419-126(A), entitled "Comparison of Indoor Toxic Air Pollution Levels in Several Southern California Communities," submitted by Research Triangle for a total amount not to exceed $12,080.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $12,080.

I hereby certify that the above is a true and correct copy of Resolution 86-113, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 9
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Augmentation Proposal No. 1419-126(A) entitled "Comparison of Indoor Toxic Air Pollutant Levels in Several Southern California Communities."

RECOMMENDATION: Adopt Resolution 86-113 approving Proposal No. 1419-126(A) for funding in an amount not to exceed $12,080.

SUMMARY: This augmentation will provide funds to perform additional analyses of vapor phase organic samples collected as part of a much larger study. The larger effort is a co-funded project with the US EPA contributing major funding. It is designed to assess personal exposures to toxic compounds.

The new data to be collected by this augmented study requires a different collection method and is needed in the Board's exposure assessment and risk management program for toxic air contaminants.

The principal investigator for this study is Dr. Pellizzari of Research Triangle Institute.

State of California
AIR RESOURCES BOARD

Resolution 86-114
December 18, 1986

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705; and

WHEREAS, an unsolicited research proposal, Number 1481-130, entitled "Proposal for ARB Support of Carbonaceous Aerosol Symposium," has been submitted by the University of California, Lawrence Berkeley Laboratory;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1481-130, entitled "Proposal for ARB Support of Carbonaceous Aerosol Symposium," submitted by the University of California, Lawrence Berkeley Laboratory for a total amount not to exceed $5,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1481-130, entitled "Proposal for ARB Support of Carbonaceous Aerosol Symposium," submitted by the University of California, Lawrence Berkeley Laboratory for a total amount not to exceed $5,000.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $5,000.

I hereby certify that the above is a true and correct copy of Resolution 86-114, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-14-4(b) 10
DATE: December 18, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1481-130 entitled "Proposal for ARB Support of Carbonaceous Aerosol Symposium."

RECOMMENDATION: Adopt Resolution 86-114 approving Proposal No. 1481-130 for funding in an amount not to exceed $5,000.

SUMMARY: The Carbonaceous Species Methods Comparison Study, which was conducted at Citrus College in August 1986, was the largest study of its kind ever conducted. Thirty research groups from the United States and Canada were funded by nine government and industry sponsors to participate in the study. An important part of the study is the presentation of research results. The Third International Conference on Carbonaceous Particles in the Atmosphere will be held at Lawrence Berkeley Laboratory (University of California system) October 5-9, 1987. The ARB has been asked for $5,000 to help defray conference expenses. A major portion of the program for this week-long conference will be presentation of results from the Carbonaceous Species Methods Comparison Study which was coordinated by the ARB.

BUDGET SUMMARY

University of California, Lawrence Berkeley Laboratory

"Proposal for ARB Support of Carbonaceous Aerosol Symposium"

BUDGET ITEMS:

$5,000 Will go toward defraying conference expenses. The money is for organizing and running the conference, and will include such items as printing, mailing, registration materials and special staff support during the meeting.

TOTAL, Direct Costs	$5,000
TOTAL PROJECT COST	$5,000

State of California
AIR RESOURCES BOARD

Resolution 86-115

December 18, 1986

Agenda Item No: 86-14-1

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to adopt standards, rules and regulations necessary for the proper execution of the powers and duties granted to and imposed upon the Board by law;

WHEREAS, in Section 43000 of the Health and Safety Code, the Legislature has declared that the emission of air pollutants from motor vehicles is the primary cause of air pollution in the state and, in Sections 39002 and 39003 of the Health and Safety Code, has charged the Board with the responsibility for systematically attacking the serious air pollution caused by motor vehicles;

WHEREAS, Section 43013 of the Health and Safety Code authorizes the Board to adopt and implement motor vehicle emission standards in order to control air pollution caused by motor vehicles;

WHEREAS, in September, 1985, the Legislature passed Senate Bill 217 (SB 217; Stats. 1985, Ch. 1138; Health and Safety Code Sections 44200-44205, 44207-44210) which directs the Board to establish, by regulation, a certification program for used motor vehicles manufactured outside the United States and not originally certified or intended for sale in California or the other 49 states (hereinafter referred to as used modifier-certified motor vehicles);

WHEREAS, the legislation provides that no used modifier-certified vehicle shall be registered in California unless a certificate of conformance is issued by the Board after the vehicle has been modified and tested for compliance with the California standards by a licensed laboratory;

WHEREAS, the legislation specifies that the Board may not establish emission control system warranty requirements nor recall requirements for any vehicle covered by the law which exhibits a defective emission control system subsequent to receiving a valid certificate of conformance;

WHEREAS, SB 217 further requires the Board to adopt regulations specifying the requirements for any laboratory seeking a license to perform vehicle emission testing of used modifier-certified motor vehicles;

WHEREAS, the Board has adopted the following certification requirements and test procedures for new passenger cars, light-duty trucks, and medium-duty vehicles: exhaust standards and test procedures (Sections 1960.1 and 1960.1.5, Title 13, California Administrative Code ("13 CAC")), evaporative emission standards and test procedures (Section 1967, 13 CAC), fill pipes and fuel tank openings (Section 2290, 13 CAC), and tune-up label specifications (Section 1965, 13 CAC);

WHEREAS, the Board has determined that the existing certification requirements and test procedures applicable to new vehicles certified by original manufacturers with the noted exceptions are necessary and technologically feasible for the purposes of controlling motor vehicle emissions;

WHEREAS, to fulfill the mandates of SB 217, the staff has proposed certification procedures based on the existing certification program (excluding warranty and recall requirements) and licensing requirements, set forth in proposed Sections 2047 and 2048, Title 13, California Administrative Code, and "California Certification Procedures for 1975 and Later Model Year Used Modifier-Certified Motor Vehicles," and "Licensing Requirements for Vehicle Emission Test Laboratories," incorporated in the proposed regulations;

WHEREAS, the staff has proposed that the applicable exhaust and evaporative emission standards for used modifier-certified motor vehicles shall be the California new vehicle emission standards for the model year of the vehicle with no deterioration factors applied;

WHEREAS, the laboratory licensing requirements proposed by the staff specify technical evaluation criteria for the licensing of laboratories which include personnel qualifications, equipment specifications, materials handling techniques, test procedures, and quality control requirements to ensure the quality of laboratory test results and as a means of auditing laboratory performance and verifying proper operation of emission control systems installed on vehicles;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce and avoid such impacts;

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code;

WHEREAS, the Board finds that:

> The importation and use in California of used motor vehicles not certified or intended for sale by the original vehicle manufacturer in the United States contributes significantly to the serious air pollution problem in this state;

It is necessary and appropriate to adopt the regulations and the incorporated guidelines set forth in Attachments A, B, and C in order to fulfill the mandates of SB 217;

The adoption of an effective certification program for used modifier-certified motor vehicles will ensure that these used vehicles imported for sale and use in California meet California emission standards for the applicable model year;

It is technologically feasible for used modifier-certified vehicles to comply with the certification requirements and test procedures set forth in Attachments A and B;

The certification requirements and test procedures for the used modifier-certified motor vehicles including the requirement for the preparation of an owner's service and repair information manual and the requirement for a smog check inspection prior to issuance of a certificate of conformance are also necessary to ensure that the vehicles will continue to comply with emission standards in use;

The licensing requirements for the vehicle emission test laboratories are necessary to meet the unique characteristics of the modification industry, to ensure the accuracy and quality of test results, to audit licensed laboratory performance, to verify the operation of emission control systems, and to ensure adequate oversight and enforcement of the certification program; and

WHEREAS, the Board further finds that adoption of the regulations and incorporated requirements and test procedures set forth in Attachments A, B, and C will not have a significant adverse environmental impact and may have a significant beneficial impact.

NOW, THEREFORE, BE IT RESOLVED that the Board hereby approves Sections 2047 and 2048, Title 13, California Administrative Code, as set forth in Attachment A; "California Certification Procedures for 1975 and Later Model Year Used Modifier-Certified Motor Vehicles," as set forth in Attachment B as modified pursuant to Board direction; and "Licensing Requirements for Vehicle Emission Test Laboratories," as set forth in Attachment C.

BE IT FURTHER RESOLVED that the Board directs the Executive Officer to make changes to Attachment B as directed by the Board and to adopt Sections 2047 and 2048, Title 13, California Administrative Code, and the incorporated certification and licensing requirements, as set forth in Attachments A and C, and Attachment B as modified after making them available to the public for a period of 15 days, provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modification as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if he determines that this is warranted.

BE IT FURTHER RESOLVED, to ensure that there are an adequate number of licensed laboratories available to perform the vehicle testing for the certification program, that the Board directs the Executive Officer to request an effective date for Section 2047 and the incorporated certification requirements set forth in Attachment B of 120 days after the licensing procedures and requirements take effect.

BE IT FURTHER RESOLVED that the Board hereby determines that the regulations approved herein will not cause the California emission standards, in the aggregate, to be less protective of public health and welfare than applicable federal standards, and will not cause the California requirements to be inconsistent with Section 202(a) of the Clean Air Act, and raise no new issues affecting previous waiver determinations of the Administrator of the Environmental Protection Agency pursuant to Section 209(b) of the Clean Air Act.

BE IT FURTHER RESOLVED that the Executive Officer shall, upon their adoption, forward the regulations and incorporated certification and licensing requirements to the Environmental Protection Agency with a request for a waiver or for confirmation that the amendments are within the scope of an existing waiver, as appropriate, if determined to be necessary pursuant to Section 209(b) of the Clean Air Act.

I hereby certify that the above is a true and correct copy of Resolution 86-115, as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider Regulations Regarding the Certification of Modifier-Certified 1975 and Later Model Year used Motor Vehicles for Sale in California and the Licensing of Vehicle Emission Test Laboratories

Agenda Item No.: 86-14-1

Public Hearing Date: December 18, 1986

Response Date: February 13, 1987

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant environmental issues pertaining to this item. The staff report identified no adverse environmental effects.

Response: N/A

Certified: Harold Salmus
Board Secretary

Date: July 29, 1987

State of California

MEMORANDUM

To : Gordon Van Vleck
Secretary
Resources Agency

Date : January 13, 1988

Subject : Filing of Notice of Decisions of the Air Resources Board

Cary Allison
Board Secretary

From : Air Resources Board

Pursuant to Title 17, Section 60007 (b), and in compliance with Air Resources Board certification under Section 21080.5 of the Public Resources Code, the Air Resources Board hereby forwards for posting the attached notice of decisions and response to environmental comments raised during the comment period.

ATTACHMENTS
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86-71
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87-61
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Adopt new Sections 2047 and 2048, under Article 7, Subchapter 1, Chapter 3, Title 13, California Administrative Code, to read as follows:

Article 7.

Procedures for Certifying Used Modifier-Certified Motor Vehicles and Licensing Requirements for Vehicle Emission Test Laboratories

2047. Purpose and Certification Procedures for Used Modifier-Certified Motor Vehicles.

(a) It is the purpose of this article to set forth the certification program for used modifier-certified motor vehicles and the licensing requirements for vehicle emission test laboratories in order to implement the authority granted the state board in Chapter 6 (commencing with Section 44200) to Part 5 of Division 26 of the Health and Safety Code.

(b) The emission standards and procedures for the certification of used modifier-certified motor vehicles in California are set forth in the "California Certification Procedures for 1975 and Later Model-Year Used Modifier-Certified Motor Vehicles," adopted by the state Board on [insert date of adoption].

NOTE: Authority cited: Sections 39600, 39601, 43013, 44201-44204, and 44208-44210, Health and Safety Code. Reference: Sections 43000, 43013, 44200-44204, and 44208-44210, Health and Safety Code.

2048. Licensing Requirements for Vehicle Emission Test Laboratories. The licensing requirements for vehicle emission test laboratories pursuant to the provisions of Health and Safety Code Sections 44203 and 44205 are set forth in the "Licensing Requirements for Vehicle Emission Test Laboratories," adopted by the state Board on [insert date of adoption.]

NOTE: Authority cited: Sections 39600, 39601, 44203, 44205, and 44207-44209, Health and Safety Code. Reference: Sections 44200, 44201, 44203-44205, and 44207-44209, Health and Safety Code.

State of California
AIR RESOURCES BOARD

CALIFORNIA CERTIFICATION PROCEDURES FOR 1975 AND LATER MODEL-YEAR USED MODIFIER-CERTIFIED MOTOR VEHICLES

Adopted: _____

NOTE: The proposed certification procedures as originally made available are shown in normal type. Subsequent modifications to the procedures are shown in double underline to indicate additions and slashes to indicate deletions from the original proposal. Headings are underlined in the original proposal and are not new additions.

CALIFORNIA CERTIFICATION PROCEDURES FOR 1975 AND LATER MODEL YEAR USED MODIFIER-CERTIFIED MOTOR VEHICLES

I. APPLICABILITY

These provisions apply to used modifier-certified motor vehicles as defined in Health and Safety Code Section 44200 and except as provided in Health and Safety Code Section 44210. These provisions are not applicable to vehicles which are less than two years old, nor to 1974 or older model year light-duty vehicles. The certification procedures for vehicles which are less than two years old are contained in the "California Certification and Compliance Test Procedures for New Modifier Certified Motor Vehicles" as incorporated by reference in Section 1964, Title 13, California Administrative Code. The 1974 or older model year vehicles shall follow the provisions under "Importation of Motor Vehicles and Motor Vehicle Engines", Subpart P, Part 85, Title 40, Code of Federal Regulations as they existed on November 15, 1972.

II. DEFINITIONS

A. "Used modifier-certified motor vehicle" means any passenger car, light-duty truck, and medium-duty vehicle which was manufactured outside of the United States for which the original manufacturer did not obtain California or federal certification, which is subsequently modified by persons other than the original vehicle manufacturer to meet California motor vehicle emission standards, and which is at least two years old.

B. "Model Year" - The model year designation for used modifier-certified motor vehicles shall be determined on the same basis as vehicles in the same engine family which were offered for sale in the United States by the original vehicle manufacturer or its authorized distributor. For purposes of this paragraph, a modifier certified motor vehicle is in the same engine family as a vehicle certified for sale in the United States by the original vehicle manufacturer if the configuration of the vehicle and engine, with the exception of the emission control system, and the engine displacement are the same. (The model year assigned must be consistent with the year model designated in the vehicle identification number of the U.S. certified vehicle.) The model year for any used modifier-certified motor vehicle in an engine family which the original vehicle manufacturer does not offer for sale in the United States shall be determined by the following, in descending order of preference:

1. Model year as encoded in the VIN by the original vehicle manufacturer; or
2. The date the vehicle was initially delivered by the original vehicle manufacturer to the non-U.S. dealer; or
3. The model year shown on the foreign title document; or
4. The production dates as provided by the original vehicle manufacturer to the Modifier and/or to the Department of Motor Vehicles.

5. When the model year is to be determined from either 2. or 4. above, if the original vehicle manufacturer has established a specified annual production period for its U.S. certified vehicles of the same make, the model year shall coincide with the production year for the U.S. certified vehicles.

C. "Modifier" means any person or entity who applies for California certification of a used modifier-certified motor vehicle.

D. "Licensed Laboratory" means any test laboratory approved by the Air Resources Board ("ARB") pursuant to Health and Safety Code Section 44205 and applicable regulations as qualified for conducting emission tests for light-duty motor vehicles in accordance with the Federal Test Procedures (Subpart B, Part 86, Title 40, Code of Federal Regulations, as it existed on July 1, 1985).

E. "Certificate of Conformance" means a document issued by the ARB through a licensed laboratory after a used modifier-certified motor vehicle is <u>tested in accordance with the federal test procedures, Title 40, Code of Federal Regulations, Part 86, Subpart B, as they existed on July 1, 1985 and</u> found to comply with the California emission standards and all other applicable requirements. Pursuant to Health and Safety Code Section 44202 and except as provided in Health and Safety Code Section 44210, a used modifier-certified vehicle may not be registered in California unless a Certificate of Conformance has been issued for the vehicle.

III. CERTIFICATION PROTOCOL

A. A modifier shall be registered by the Bureau of Automotive Repair as a California Automotive Repair Dealer pursuant to Business and Professions Code Sections 9884 et seq.

B. To obtain a Certificate of Conformance for a used modifier-certified motor vehicle, the modifier shall provide the following to a licensed laboratory:

1. The vehicle as modified pursuant to the requirements contained herein;

2. A written application in an ARB-approved format which includes the following:

a. A description of the vehicle including the manufacturer, make, model, model year, engine family, and Vehicle Identification Number or chassis number.

b. The age of the vehicle as determined pursuant to Health and Safety Code Section 44200 and evidenced by the foreign ownership document and custom's entry summary on the date of vehicle entry in California any supporting information or documentation.

c. The owner's manual prepared for the vehicle pursuant to the requirements contained herein; and

d. A written statement that the vehicle has been modified in accordance with the requirements contained herein.

C. The licensed laboratory shall test the vehicle for compliance with emission standards, in accordance with the federal test procedures, Title 40, Code of Federal Regulations, Part 86, Subpart B, as they existed on July 1, 1985. Upon confirming that the vehicle complies with the applicable emission standards and that the modifier has complied with all applicable requirements contained herein, the licensed laboratory shall issue a certificate of conformance for the vehicle. In addition, the laboratory shall obtain ~~issue~~ a Smog Check ~~or MVPC~~ Certificate of Compliance for the vehicle from a Smog Check referee station.

D. Each certificate of conformance issued shall contain the following:

1. A description of the vehicle, including manufacturer, model-year, model and vehicle identification number.
2. A list of critical emission control components (as defined in Section 86.88-2, Title 40, Code of Federal Regulations, as it existed on March 15, 1985) with part numbers, for that vehicle.
3. The applicable model year, emission standards and laboratory test results for exhaust and evaporative emissions.
4. The date of manufacture, Custom's entry number, date and port of entry, and the declared value.
5. The modifier's name, address, and automotive repair dealer registration number and the date the emission system modification was completed.
6. A written statement signed by the laboratory manager which certifies that the vehicle was inspected, provides a detailed

description of the inspection, and states that the emission control system installed on the vehicle has no obvious engineering or installation defects at the time of inspection.

7. A statement, executed by a responsible officer of the modifier, under penalty of perjury, that the vehicle has been modified to comply with the requirements of Chapter 6, Part 5, Division 26 of the Health and Safety Code, and that the modifier has received the U.S. Department of Transportation bond release for safety and the U.S. Environmental Protection Agency release for the vehicle.

8. A statement, executed by a responsible officer of the licensed laboratory, under penalty of perjury, that the vehicle has been inspected and emission tested by the laboratory, that the emission control system components were installed and functional at the time the test was performed, that the owner's manual with the vehicle contains a true and accurate description of the emission control system's functioning and maintenance, and that the vehicle complies with the applicable California requirements and emission standards.

E. The Certificate of Conformance and Smog Check ØY/MVPQ Certificate of Compliance shall be used by the vehicle owner to register the vehicle. The certificate shall also be presented to the licensed mechanic performing the inspection whenever the vehicle is subsequently required to receive a Smog Check ØY/MVPQ inspection.

F. A licensed laboratory is authorized to charge a fee of $200.00 for each Certificate of Conformance issued for a used modifier-certified motor vehicle. This fee may be increased annually by an amount not to exceed ten percent (10%) at the discretion of the Executive Officer.

G. The ARB may request the licensed laboratory to submit any used modifier-certified motor vehicle for confirmatory emission testing. The licensed laboratory shall notify the modifier that the ARB may perform such confirmatory tests as specified in Section IV.C.2.e. of the "Licensing Requirements for Vehicle Emission Test Laboratories". Vehicles selected for confirmatory testing along with their Certificates of Conformance shall be taken to ARB by a licensed laboratory for testing. A licensed laboratory with certified vehicles failing the confirmatory tests shall be subject to penalties specified under Section IV. F. of the "Licensing Requirements for Vehicle Emission Test Laboratories." The ARB shall retain the Certificate of Conformance of vehicles failing the confirmatory tests until the discrepancies in the test results are resolved.

H. If a licensed laboratory determines that a vehicle does not meet the applicable emission standards or that the modifier has not complied with all applicable requirements, the laboratory shall not issue a certificate of conformance and shall return the vehicle and the application to the modifier for any necessary repairs or changes.

IV. CERTIFICATION REQUIREMENTS

A. 1. A used modifier-certified motor vehicle complies with the applicable California emission standards if the emission levels resulting from exhaust and evaporative emission testing at a licensed laboratory performed according to the federal test procedures, Title 40, Code of Federal Regulations, Part 86, Subpart B, as they existed on July 1, 1985, ~~referenced in Section III.A.2 of "Certification Requirements for Vehicle Emission Tests and Adjustments"~~ are equal to or less than the applicable emission standards with no deterioration factors applied. The applicable emission standards for used modifier-certified motor vehicles shall be the California new vehicle emission standards for the model year of the vehicle as specified in Title 13, California Administrative Code.

2. A used modifier-certified motor vehicle with emission test levels exceeding any emission standards by less than 15 percent for each pollutant (HC, CO, NOx or particulate) may be re-tested once. If subsequent modifications and emission testing are required, the modifier shall submit to the licensed laboratory records of additional repairs or modifications on the modified vehicle and the reasons for doing such repairs.

B. The gasoline-powered new vehicle "Specifications for Fill Pipes and Openings of Motor Vehicle Fuel Tanks" as incorporated by reference in Title 13, California Administrative Code, Section 2290, shall apply to 1977 or later model year used modifier-certified motor vehicles. An unleaded fuel inlet restrictor and an unleaded fuel label on the area surrounding the restrictor shall be installed on any catalyst-equipped vehicle as set forth in Section 80.24, Title 40, Code of Federal Regulations, as it existed on June 28, 1983. The requirements shall be consistent with the model year of the vehicle.

C. The new vehicle "California Motor Vehicle Tune-Up Label Specifications" as incorporated by reference in Title 13, California Administrative Code, Section 1965, shall apply to used modifier-certified motor vehicles for the model year of the vehicle with the following additions:

1. An "Emission Control Information" label shall be affixed to each used modifier-certified motor vehicle which clearly states that the vehicle has been modified to comply with California emission control requirements. The label shall show the modifier's name, address, telephone number and California automotive repair dealer registration number, as well as the emission control component codes used for the visual portion of the California Smog Check Program, the model year, and the date the modification was completed. A vacuum hose routing diagram shall also be installed on each vehicle.

The labels shall be placed underhood in a permanent, visible, and accessible location, but not on the engine.

2. The Vehicle Identification Number shall be permanently imprinted on the catalytic converter.

D. Each used modifier-certified motor vehicle shall be provided with an owner's manual which shall be considered as an integral part of the emission control system. This manual shall contain the following service and repair information:

1. A description of the retrofit system and changes made to the original engine configuration.
2. Schematic diagrams of the electrical, mechanical, fluid and vacuum systems of the retrofit system.
3. A description of the function and operation of the system in terms that a motor vehicle mechanic with a general understanding of emission control systems can readily follow.
4. A list of major parts included in the retrofit system, including the manufacturer of the original parts, the source of replacement parts including alternative parts, if any, and the warranty, if any, which is provided.
5. The periodic maintenance procedures associated with the retrofit system, including adjustments and a description of how they differ from the original procedures.

E. Any 1980 or later used modifier-certified motor vehicle equipped with a mechanism for adjusting the idle air/fuel mixture shall conform with the provisions specified under Section 5.e., "California Exhaust Emission Standards and Test Procedures for 1981

State of California
AIR RESOURCES BOARD

LICENSING REQUIREMENTS FOR VEHICLE EMISSION TEST LABORATORIES

Adopted: _____

NOTE: The proposed licensing requirements as originally made available are shown in normal type. Subsequent modifications to the requirements are shown in double underline to indicate additions and slashes to indicate deletions from the original proposal. Headings are underlined in the original proposal and are not new additions.

LICENSING REQUIREMENTS FOR VEHICLE EMISSION TEST LABORATORIES

I. APPLICABILITY

These licensing requirements adopted pursuant to Chapter 6, Part 5, Division 26 of the Health and Safety Code shall apply to any laboratory performing emission tests for the certification of used modifier-certified motor vehicles.

II. DEFINITIONS

A. "Licensed Laboratory" means any test laboratory approved by the Air Resources Board, pursuant to the requirements contained herein, as capable of conducting emission tests for light-duty motor vehicles in accordance with the Federal Test Procedures.

B. "Used modifier-certified motor vehicle" means any passenger car, light-duty truck, and medium-duty vehicle which was manufactured outside of the United States for which the original manufacturer did not obtain California or federal certification, which is subsequently modified by persons other than the original vehicle manufacturer to meet California motor vehicle emission standards, and which is at least two years old. The model year designation of a vehicle shall be determined according to the provisions in Section II. B. of the "California Certification Procedures for 1975 and Later Model Year Used Modifier-Certified Motor Vehicles."

C. "Certificate of Conformance" means a document issued by the ARB through a licensed laboratory after a used modifier-certified motor vehicle is found to comply with the California emission standards

and all other applicable requirements. Pursuant to Health and Safety Code Section 44202 and except as provided in Health and Safety Code Section 44210, a used modifier-certified vehicle may not be registered in California unless a Certificate of Conformance has been issued for the vehicle.

D. "Correlation testing" is a means of evaluating the performance of a laboratory by performing actual vehicle emission tests following established test methods and comparing the results to those of the reference laboratory. For the purposes of correlation testing, the Air Resources Board's Haagen-Smit Laboratory (HSL) shall be considered the reference laboratory. The ARB may designate another laboratory as the reference laboratory provided correlation between the laboratory and HSL has been demonstrated.

E. "Contractor" means a private entity which may be assigned by the Air Resources Board to evaluate applications for licensing and to oversee quality control and correlation testing of licensed laboratories.

III. FUNCTIONS OF LICENSED LABORATORIES

A. A licensed laboratory shall perform the following functions:

1. Verify the model year of used modifier-certified motor vehicles.

2. Conduct exhaust and evaporative emission testing of used modifier-certified motor vehicles in accordance with the applicable model year emission test procedures as specified under the federal test procedures, Title 40, Code of Federal Regulations, Part 86, Subpart B, as they existed on July 1,

1985 as set forth in Appendix I; other pertinent provisions under the "California Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles" as incorporated in Section 1960.1, Title 13, California Administrative Code; and California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Liquefied Petroleum Gas or Gasoline-Powered Motor Vehicles" as incorporated in Section 1976, Title 13, California Administrative Code.

3. Verify that the emission control components on used modifier-certified motor vehicles are properly installed and operational with the laboratory manager attesting that the emission control system installed on the vehicle has no obvious engineering or installation defects at the time of inspection. A licensed laboratory shall verify that the labels and the emission control components listed in the owner's manual correspond with the emission control system installed. Furthermore, a licensed laboratory shall verify that the fill pipe, the opening of the fuel tank and the mechanism for air/fuel adjustment installed in the vehicle comply with the requirements specified under Section IV, "California Certification Procedures for 1975 and Later Model Year Used Modifier-Certified Motor Vehicles".

4. Issue Certificates of Conformance to used modifier-certified motor vehicles which are in compliance with the California emission standards and other certification requirements listed

under Section IV, "California Certification Procedures for 1975 and Later Model Year Used Modifier-Certified Motor Vehicles."

5. Perform Smog Check or MVPC emission testing of vehicles and issue Obtain Smog Check or MVPC Certificates of Compliance from Smog Check reference stations for to vehicles which receive Certificates of Conformance.

B. Emission test results from a licensed laboratory shall be used solely to determine if vehicles conform with the California emission standards. This information shall not be presented as a product endorsement for an emission control system hardware or design.

IV. LICENSING PROTOCOL

A. FEES

A non-refundable annual fee of $5,500 payable in advance to the Air Resources Board (ARB) shall be charged for each application for license or renewal. Licenses shall be renewed annually.

B. APPLICATION FORMS

1. A laboratory applying for initial licensing shall submit an application form to ARB consisting of:

   a. A completed ARB laboratory questionnaire.

   b. A quality control test plan in accordance with paragraph IV.C.1.b. of this document.

   c. Copies of current calibration data for laboratory equipment.

   d. Other supplementary information as specified in the laboratory questionnaire.

2. The renewal application shall be in the same format as the initial application and shall reflect changes in the laboratory including movement of critical personnel, laboratory location, ownership, and changes to major equipment.

C. REQUIREMENTS

1. Technical Evaluation Criteria

Each application for laboratory licensing shall be evaluated by ARB or its contractor in accordance with the following technical evaluation criteria:

a. The laboratory shall demonstrate the technical competence of its staff.

(1) Each person involved in the inspection and testing of emission control systems may be required to take a qualification test developed by ARB or its contractor.

(2) The performance of laboratory personnel shall be subject to observation through on-site assessment of laboratory operation.

b. Each licensed laboratory shall conform with equipment and quality control requirements specified under Sections 86.106 to 86.126, Title 40, Code of Federal Regulations.

c. Material handling techniques used for test fuels and analytical gases shall comply with requirements listed in Sections 86.113 and 86.114, Title 40, Code of Federal Regulations, and Section 3.h. of the "California Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-duty Trucks and Medium-duty

Vehicles" as incorporated in Section 1960.1, Title 13, California Administrative Code.

d. Test procedures being practiced shall comply with Sections 86.127 to 86.140, and 86.143, Title 40, Code of Federal Regulations, Sections 3.1., 3.n., and 3.o., of the "California Emission Standards and Test Procedures for 1981 and Subsequent Model Passenger Cars, Light-duty Trucks, and Medium-duty Vehicles" as incorporated in Section 1960.1, Title 13, California Administrative Code and Section 6. of the "California Evaporative Emission Standards and Test Procedures for 1978 and Subsequent Model Liquefied Petroleum Gas- or Gasoline Powered Motor Vehicles" as incorporated in Section 1976, Title 13, California Administrative Code.

2. Other Requirements

Each laboratory applying for a license shall agree to the following conditions:

a. Licensed laboratories shall purchase from ARB in advance, numbered Certificates of Conformance which will be issued as specified under Section III. B. and C., "California Certification Procedures for Used Modifier-Certified Motor Vehicles." The licensed laboratory shall furnish ARB with a copy of each Certificate of Conformance issued within 30 days of its issuance.

b. Each licensed laboratory shall perform functions specified under Section III of this regulation.

c. Licensed laboratories shall perform correlation testing and quality control consisting of:

(1) Calibrations and checks as specified in Sections 86.116 through 86.126, Title 40, Code of Federal Regulations.

(2) A correlation test program at intervals to be specified by ARB or its contractor which may include:

- Exhaust emission tests
- Evaporative emission tests
- Coast down tests
- Steady-state tests

(For the tests above, the test vehicle shall be provided by ARB.)

- CVS system verification (propane tests)
- CVS flow and response checks
- Gas cylinder checks
- Manual checks on soak temperature, humidity and barometer checks
- NOx converter efficiency checks
- CO_2/H_2O interference checks
- Back pressure checks

d. The ARB will or its contractor shall randomly inspect laboratory facilities and any vehicles on the premises of a licensed laboratory for purposes of laboratory quality assessment or vehicle inspection.

e. Each licensed laboratory shall agree to hold all vehicles and certificates at the laboratory for five calendar days following testing to assure availability of vehicles for inspection and confirmatory testing. Upon request by ARB, a licensed laboratory shall further agree to hold vehicles up to a maximum of additional five calendar days. Immediately after vehicle selection for confirmatory testing, ARB will seal the hoods of vehicles chosen. The licensed laboratory shall deliver these vehicles to ARB. Following delivery of a vehicle, the ARB may retain the vehicle for testing for up to five working days.

f. The licensed laboratory shall maintain the following records of emission testing and quality control in a format prescribed by ARB:

(1) Submit vehicle test records monthly to ARB, identified by vehicle identification number, which include:

(a) CVS data sheet, showing exhaust emission results in grams/mile, input values, full vehicle information, and start and stop times for vehicle test segments.

(b) Exhaust emissions mass calculation sheet.

(c) Evaporative emission data sheet, showing evaporative emissions in grams.

(d) Evaporative emission mass calculation sheet.

(e) Driver's trace.

(f) Fuel analysis for fuel used in test.

(g) Cold soak temperature chart.

(h) Photographs of major emission control components including the unleaded fuel inlet restrictor and unleaded label on the area surrounding the fuel inlet restrictors.

(i) Particulate emission data sheets for diesel vehicles.

(j) Records submitted by the modifier of additional repairs or modifications on the modified vehicle and the reasons for doing such repairs.

(2) Maintain records of test conditions and emission test results as specified under Section 86.142, Title 40, Code of Federal Regulations as well as records of calibration and quality control test data and have these records available for review upon ARB's request. These records shall be retained by the licensed laboratory for a period not less than seven years after the records have been generated.

(3) Maintain a continuous log of testing activities containing vehicle descriptions, type of test, reason for tests, start time, end time, and raw test data.

g. The Licensed Laboratory shall have a Smog Check or MVPC License from the Bureau of Automotive Repair.

D. Each application for laboratory licensing shall be evaluated based on the information from the completed questionnaire, and an on-site assessment by the ARB or its contractor. The results of the evaluation shall be submitted to the Executive Officer with a recommendation on whether to issue a license. An Executive Order shall be issued to each laboratory meeting the requirements for licensing under III.C. of this document. The Executive Officer may deny an application and refuse to issue a license for reasonable cause. A laboratory denied licensing shall be formally advised of the reasons for denial.

E. A laboratory denied a license may request reconsideration of its application pursuant to the procedures in Section V of this document.

F. 1. A licensed laboratory with certified vehicle(s) failing confirmatory tests shall submit to ARB its reasons for the emission test failure along with supporting data within 30 calendar days of receipt of written notification from the Executive Officer. Upon review by the Executive Officer, the license of a laboratory found to be certifying imported vehicles that do not conform with the requirements specified in this regulation/ may be suspended or revoked.

2. A licensed laboratory may request a hearing to notify the Executive Officer of its objections to the suspension or to discuss corrective actions.

3. A licensed laboratory may be subject to the penalties listed under Section 43016 of the Health and Safety Code for

certification of noncomplying vehicles for the period starting with the most recent confirmatory or quality control cross check with ARB and ending with the vehicle(s) failing the confirmatory test.

V. REVOCATION, SUSPENSION, OR DENIAL OF A LABORATORY LICENSE

A. A laboratory license may be revoked, suspended, denied, or withheld if:

1. The laboratory submits false or incomplete information in its application.
2. The laboratory renders false or inaccurate emission test data.
3. The laboratory fails to comply with the requirements under Section IV.C. of this regulation.

Upon revocation or suspension, any unused certificates of conformance shall be returned to the ARB upon request.

B. In any case where a license is denied or withheld, the laboratory may request the Executive Officer for reconsideration of the decision. The request shall be in writing, signed by an authorized representative of the laboratory and shall include a statement specifying the laboratory's objections to the Executive Officer's decision and data in support of such objections. After a review of the request and supporting data, the Executive Officer may schedule a hearing, if he or she finds that the request raises substantial issues.

C. Any revocation or suspension under paragraph A. of this section shall be made only after the laboratory has been offered an opportunity for a hearing.

D. Any laboratory which knowingly submits false or inaccurate information, renders inaccurate or invalid test data, or commits any other fraudulent acts related to the certification of used modifier-certified motor vehicles shall be subject to penalties under Section 44209, Health and Safety Code.

E. A licensed laboratory may apply for reinstatement of its license after revocation but no sooner than one year after the date of revocation. A laboratory applying for reinstatement shall follow all of the procedures and comply with all of the requirements for the initial licensing of a laboratory.

State of California
AIR RESOURCES BOARD

Resolution 86-116

December 18, 1986

Agenda Item No.: 86-14-2

WHEREAS, Health and Safety Code Section 41805.5 requires the Air Resources Board ("Board"), in coordination with the air pollution control districts, to develop and publish test guidelines for landfill gas and ambient air testing at active solid waste disposal sites on or before February 1, 1987;

WHEREAS, the Air Resources Board staff, with the participation of representatives of local air pollution control districts, have prepared a proposed guidance document titled "Testing Guidelines for Active Solid Waste Disposal Sites" ("Guidelines");

WHEREAS, Board staff has held public workshops to receive comments from landfill owners and other interested persons on the proposed Guidelines;

WHEREAS, the Board has held a noticed public meeting to consider approval of the proposed Guidelines and has received and considered the public comments presented by its staff, representatives of the districts, affected government agencies, affected businesses, and other interested persons and agencies on the proposed Guidelines;

WHEREAS, Health and Safety Code Section 41805.5 requires owners of active solid waste disposal sites to submit a solid waste air quality assessment test report to the local air pollution control districts;

WHEREAS, Health and Safety Code Section 41805.5 requires the Air Resources Board to publish guidelines specifying air contaminants to be tested for and identifying acceptable testing, analytical and reporting methods;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as proposed if feasible alternatives or mitigation measures are available; and

WHEREAS, the Board finds that:

the proposed Guidelines set forth in the proposed "Testing Guidelines for Active Solid Waste Disposal Sites" fulfill the requirements of Health and Safety Code Section 41805.5; and

no significant adverse environmental impacts associated with the proposed Guidelines have been identified, and no potentially adverse environmental effects are likely to result from the implementation of the proposed Guidelines.

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board approves the proposed "Testing Guidelines for Active Solid Waste Disposal Sites" dated December 18, 1986, as set forth in Attachment A.

BE IT FURTHER RESOLVED that the Executive Officer shall publish and forward the Guidelines to air pollution control districts for their use in evaluating solid waste disposal site air quality assessment test reports.

I hereby certify that the above is a true and correct copy of Resolution 86-116, as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ATTACHMENT A

State of California
Air Resources Board

TESTING GUIDELINES FOR ACTIVE SOLID WASTE DISPOSAL SITES

As Required By
California Health and Safety Code Section 41805.5

Prepared by

California Air Resources Board
Stationary Source Division
Toxic Pollutants Branch

and

California Air Pollution Control Officers Association
Landfill Gas Testing Guidelines Working Committee

December 18, 1986

ACKNOWLEDGEMENTS

This document was written with the help of the CAPCOA Guidelines Committee whose time, energy, and patience has been greatly appreciated. We would particularly like to thank:

District Representatives

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Larry Borrelli	Monterey Bay Unified APCD
Eric Skelton	Sacramento County APCD
Carl Norstedt	San Bernardino County APCD
Paul Sidhu	San Diego County APCD
Stella Willcox	San Diego County APCD
Fred Lettice	South Coast AQMD

ARB Representatives

Robert Barham
Kerry Holliday

Government Refuse Collection and Disposal Association Representatives

Patrick Maxfield	Sacramento County Solid Waste Management Division
John Boss	Sacramento Department of Public Works

California Waste Management Board Representative

Bill Orr

State Water Resources Control Board Representative

Jeff Barnickol

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TESTING GUIDELINES
FOR ACTIVE SOLID WASTE DISPOSAL SITES
Prepared Pursuant to California Health and Safety Code Section 41805.5

I. INTRODUCTION

A. Background

In 1984, the California Legislature passed and the governor signed AB 3525 (Calderon). This bill set forth gas and ambient air testing requirements at disposal sites in California. In response to the passage of AB 3525, the California Air Pollution Control Officers Association (CAPCOA) asked the Air Resources Board (ARB) staff to participate in the development of testing and evaluation guidelines for test reports prepared pursuant to the statute. In September 1986, while the CAPCOA committee was developing these guidelines, the governor signed AB 3374 (Calderon) (Health and Safety Code Section (HSC) 41805.5, attached as Appendix A) which made modifications to AB 3525. As part of the new statute, the ARB was directed, in consultation with the air pollution control districts, to develop guidelines to implement the new statute. AB 3374 requires these guidelines to contain information "specifying the air contaminants to be tested for, and identifying acceptable testing, analytical, and reporting methods to be employed in completing the report" required by the statute. ARB staff, jointly with the original CAPCOA committee, has developed these guidelines to comply with AB 3374. Also participating in the development of these guidelines was the Waste Management Board, the Water Resources Control Board, and the Government Refuse Collection and Disposal Association. These guidelines also reflect appropriate comments received during the public review of the CAPCOA guidelines developed for AB 3525.

HSC 41805.5 requires all active disposal sites to conduct tests and measurements to determine the composition of landfill gases, the presence of specified air contaminants in the ambient air, and whether off site subsurface migration of landfill gas is occurring. HSC 41805.5 also directs the ARB to publish landfill testing guidelines "specifying air contaminants to be tested for and identifying acceptable testing, analytical and reporting mentods." An active disposal site is one which is currently receiving solid waste or has received solid waste after January 1, 1984. HSC 41805.5 requires all active disposal sites to report test results to air pollution control officers (APCO) by July 1, 1987. If, however, the report is not complete by July 1, 1987, the APCO may place the disposal site on a compliance schedule which includes a date by which the report must be filed. This date may not be later than January 1, 1989.

HSC 41805.5 defines an inactive disposal site as one which has not received solid waste since January 1, 1984. These disposal sites should have completed and filed a screening questionnaire with the local APCO before November 1, 1986. Inactive disposal sites should contact their APCD for information on the questionnaire.

These guidelines are intended for sites which accept solid waste. Guidelines for sites which accept or have accepted hazardous waste will be published at a later date.

The guidelines are designed to provide a screening of disposal sites to determine which disposal sites in the state may pose a potential public health risk. The testing procedures and the amount of testing suggested in the guidelines are the first step in this screening process. The APCOs will review the test reports, and if the APCO

determines the sites may pose a health risk, the sites may have to conduct additional monitoring or take remedial action.

All disposal site owners must submit testing proposals to the APCO for approval before any testing can begin. Climate and land differences in different parts of the state may require variations in the test procedures. Accordingly, testing and procedure variations are allowed in the guidelines.

B. Report To The Air Pollution Control Officer

HSC 41805.5 requires all disposal site owners to submit a test report to the local APCO. The test report for active disposal sites is due on July 1, 1987. To comply with HSC 41805.5, the test report must contain:

"1. Chemical characterization test results to determine the composition of gas streams immediately above the solid waste disposal site, or immediately above the solid waste disposal site and within the solid waste disposal site.

2. Analyses for specified air contaminants in the ambient air adjacent to the solid waste disposal site to determine the effect of the site on air quality.

3. Test results to determine if there is any underground landfill gas migration beyond the solid waste disposal site's perimeter."

HSC 41805.5 requires all solid waste assessment test reports to be filed by July 1, 1987. If, however, the report is not complete by that date, the APCO can place the disposal site on a compliance schedule which includes a date by which the report must be filed. Because the ARB must file its final report to the Legislature by July 1, 1989, all disposal site reports must be filed with the APCDs by January 1989.

To ensure an adequate solid waste assessment test report is prepared, each disposal site owner must submit a proposal to the APCO for approval. The proposal should include a description of the gas characterization system to be used, location of all monitoring wells, both on and off the site, an ambient air monitoring plan, and all the results of past air or landfill gas testing performed at the site, including the results of any testing done to prepare the proposal. Testing *cannot* begin until the APCO approves the monitoring plan.

The very large number of active sites, the indefinite number of inactive sites which may require testing, and the limited laboratory capacity will make it difficult for all sites to meet these deadlines. Limited testing and analytical resources will need to be used on sites which may present a more serious threat to public health. Accordingly, in order to meet the schedule prescribed by HSC 41805.5 and to allocate scarce resources, active solid waste disposal sites are divided into Category I and Category II sites. Category II sites are those with a filled surface area less than twenty-five acres, total waste in place of less than 500,000 tons, and with no occupied building within one thousand feet of the site perimeter. All other sites are Category I sites.

C. Category I Sites

For the gas stream characterization test, the owner will perform either the integrated surface sample or the landfill gas test and the integrated surface sample to determine

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C. Category I Sites

For the gas stream characterization test, the owner will perform either the integrated surface sample or the landfill gas test and the integrated surface sample to determine

what is in the landfill gas. Section II contains the gas stream characterization procedures. For the ambient air test, the site owner will conduct a meteorological survey and 3 days of ambient air monitoring at the site perimeter. Section III contains the ambient air testing information. For the gas migration test the owner will install one migration test well for each 1000 feet of site perimeter and sample the well to determine if there is off site gas migration. Section IV contains the gas migration testing information.

D. Category II Sites

The Category II sites may meet the HSC 41805.5 requirements by conducting the testing specified for Category I sites, or alternatively by conducting an emissions screening, landfill gas sample, limited ambient air monitoring, and limited off site gas migration testing. During the emissions screening, the technician walks over the disposal site, and using a flame ionization detector, notes any readings above 50 parts per million total organics as methane. For the disposal site gas test, one sample of landfill gas is taken from the center of the site and analyzed for the Attachment 1 compounds, methane, carbon dioxide, oxygen, and nitrogen at the disposal site detection limits. For the ambient air testing, the owner can conduct one twenty-four hour sample downwind of the disposal site and assume that upwind concentrations approach zero. For the off site gas migration testing, a maximum of four probes are installed around the disposal site and tested for total organics as methane. Section V contains the specific procedures for Category II testing.

To ensure that the site is adequately characterized, the Category II site will also be required to complete the questionnaire in Attachment 3 if the alternative limited testing is conducted. The APCO will evaluate the Category II site reports, and based on the information submitted, will determine whether further testing is necessary.

E. Report To The Air Resources Board

Government Code Section 66796.54(b) requires the ARB to prepare a report to the legislature on "the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the ambient air quality of the state." In order to prepare this report the ARB will review the data gathered under the guidelines. The form for the report to the ARB is attached as Appendix B. This form should be completed by the site owner and forwarded to the APCO with the solid waste assessment test report. Once the APCO determines the solid waste assessment test report is adequate, the form should be forwarded to the ARB.

II. GAS STREAM CHARACTERIZATION

HSC 41805.5 requires solid waste assessment test reports to include test results to determine the composition of gas streams immediately above the site, or immediately above the site and within the site, as appropriate, as determined by the APCO. Based on information provided on the individual disposal site, the APCO must determine which method is appropriate to characterize the disposal site. To meet the requirements, the test may consist of one of the following:

1. Testing the air immediately above the disposal site surface using the integrated surface sampling technique, or

2. Testing the air immediately above the disposal site surface and testing the gas within the disposal site using both the integrated surface sample and the landfill gas sample.

If the APCO approves characterization of the landfill gas by sampling the air immediately above the disposal site, then integrated surface samples are taken. An integrated surface sample involves sampling the air three inches above the disposal site surface while a technician walks a prescribed course with the sampling equipment over one 50,000 square-foot grid of the disposal site surface. The process is repeated for five 50,000 square-foot grids of the site and the samples are analyzed for the Attachment 1 compounds. Methane is also tested for to gather information on overall disposal site emissions.

Landfill gas testing involves taking samples of the landfill gas out of the interior of the disposal site and testing them for the Attachment 1 compounds. The samples are also analyzed for oxygen and nitrogen for information on sample integrity. Carbon dioxide and methane concentrations will give information on gas production.

If the APCO approves characterization of the landfill gas by sampling the air immediately above the disposal site surface and within the disposal site, the owner should conduct the disposal site gas testing as set out in these guidelines, and the integrated surface sampling for one 50,000 square-foot grid of the disposal site.

Landfill gas testing requires the compounds listed in Attachment 1 to be determined to the "disposal site" detection limits. Integrated surface sampling requires the compounds listed in Attachment 1 to be determined to the "air" detection limits.

A. Landfill Gas Testing

If the disposal site has an operating interior gas collection system, samples should be taken from the system; additional wells need not be installed. Each installed well should be to a depth of at least 6 feet below the bottom of the intermediate or final cover. The well should not penetrate any leachate liner. During installation the contractor should take appropriate steps to mitigate the public nuisance of gas escape. All wells should be capped when not being sampled.

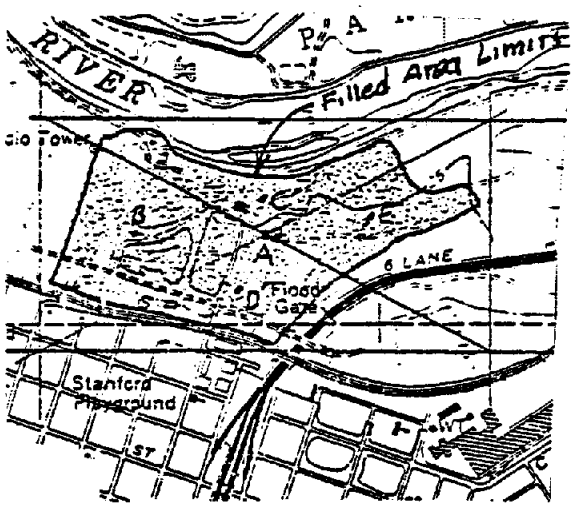

Figure 1: Well Location Example

To locate the wells, draw a box around the disposal site on a scale map with the box sides 100 feet outside the filled area edge. The sides should run north-south, east-west. Connect the opposite corners with diagonals. Locate 5 points: Point A at the diagonal intersection, point B at the center of the largest sector formed by the diagonals and the filled area, point C at the center of the next larger sector, point D at the center of the next larger sector, and point E at the center of the smallest sector. Figure 1 is an example. Five samples should be taken, one sample from each well and analyzed for the Attachment 1 compounds.

2. Testing the air immediately above the disposal site surface and testing the gas within the disposal site using both the integrated surface sample and the landfill gas sample.

If the APCO approves characterization of the landfill gas by sampling the air immediately above the disposal site, then integrated surface samples are taken. An integrated surface sample involves sampling the air three inches above the disposal site surface while a technician walks a prescribed course with the sampling equipment over one 50,000 square-foot grid of the disposal site surface. The process is repeated for five 50,000 square-foot grids of the site and the samples are analyzed for the Attachment 1 compounds. Methane is also tested for to gather information on overall disposal site emissions.

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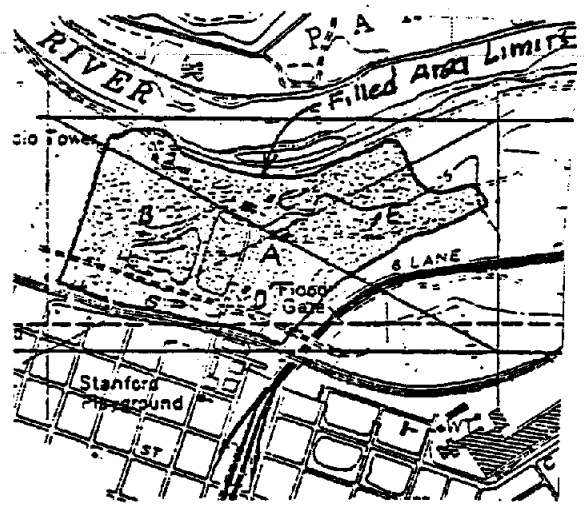

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To complete the HSC 41805.5 requirements for characterizing landfill gas, the owner should perform an investigation of methane emissions from one 50,000 square-foot grid of the disposal site along with the landfill gas test. The grid selected should be approved by the APCO and the owner should use methods described in these guidelines.

1. Protocol

The technician should make certain the seal around the top of the well does not allow air infiltration. The well should not be sampled until 24 hours after the installation is complete. To sample the well, the technician attaches the pump and withdraws at least 2 well volumes from the well. The technician then attaches the bag and draws a ten liter sample at a one liter per minute rate. The bag should be in a light sealed container and should be analyzed within 72 hours.

If the owner chooses to leave the well intact for future sampling, the pipe should be capped or a valve installed to prevent gas leakage. If the owner removes the well, the hole should be filled and resealed to prevent gas escape.

2. Data

For each sample, the owner should record:

a. Date, time, and sample location.

b. Methane, CO_2, oxygen, and nitrogen concentrations.

c. Concentrations of compounds listed in Attachment 1. Analytical methods are included in Attachment 2.

d. The operating schedule, status, and gas quantity extracted for any landfill gas collection system for the previous 3 days for each day sampled.

B. Integrated Surface Sampling

The integrated surface sample is a method of characterizing disposal site emissions. Integrated surface sampling is designed to sample the landfill gas emissions immediately after they have passed through the disposal site final cover and entered the atmosphere. Because the sampling system will dilute the emitted landfill gas, use of more sensitive analytical methods are necessary to adequately characterize the sample.

The owner will collect and analyze a minimum of five samples, one sample from each 50,000 square foot grid centered on points as determined in Figure 1 on page 4, and one sample from the air over the liquid near the edge of each evaporation pond on the site. Figure 2 is a typical walking pattern for each grid.

Sloped areas of the disposal site should be investigated along with the level areas. If investigation of the steep areas is a safety concern, the owner does not have to test these areas. The areas not to be tested must be approved prior to the testing by the APCO.

1. Number of Samples

One sample will be collected from each of the five grids, and one sample from near the edge of any evaporation pond on the site.

2. Sampling Conditions

a. Average wind speed suitable for this sampling procedure is less than 5 miles per hour. Surface sampling should be terminated when the average wind speed exceeds 5 miles per hour or the instantaneous wind speed exceeds 10 miles per hour. Average wind speed is determined on a 10 minute average.

b. Surface monitoring is to be conducted when the disposal site is dry and no rain has fallen. The disposal site is considered dry when there has been no rain for the 72 hours prior to sampling.

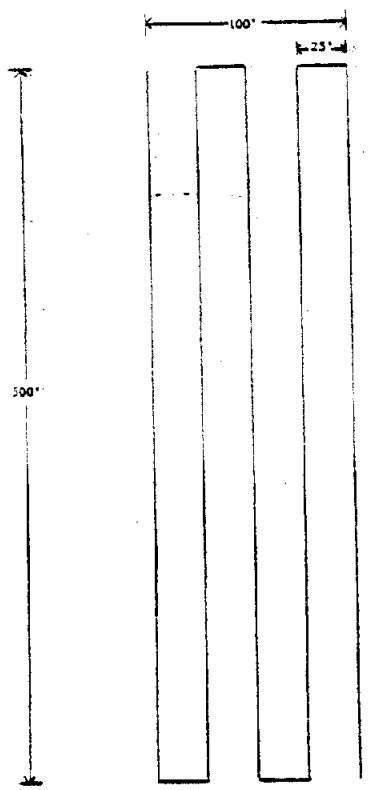

Figure 2: Walking Pattern
Source: South Coast AQMD

3. Equipment Description

An integrated surface sampler is a portable self-contained unit with its own internal power source. The integrated sampler consists of a stainless steel collection probe approximately 3.5 inches in diameter (funnel: 316 stainless steel), a flow meter, a pump, and a 10-liter Tedlar® bag enclosed in a light sealed cardboard box.

a. Power: Two 9 volt batteries.

b. Pump: One 12V DC pump. The diaphragm is made of nonlubricated Viton® rubber. The maximum pump unloaded flow rate is 4.5 liters per minute.

c. One 10-liter Tedlar® bag with a valve. The Tedlar® bag is contained in a light sealed cardboard box to prevent photochemical reactions from occurring during sampling and transportation. The valve is a push-pull type constructed of aluminum and stainless steel, with a Viton® o-ring seal.

d. Rotameter made of borosilicate glass with a flow range of 0 to 1 liter per minute. The scale is in milliliters with major graduations (labeled) every 5 ml and minor graduations every 1 ml.

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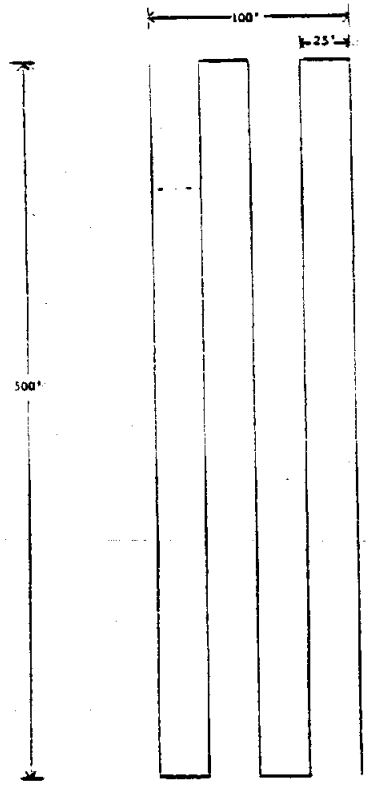

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d. Rotameter made of borosilicate glass with a flow range of 0 to 1 liter per minute. The scale is in milliliters with major graduations (labeled) every 5 ml and minor graduations every 1 ml.

e. Air Flow Control Orifice: Needle valve in the flow meter.

f. Funnel: 316 stainless steel.

g. Fittings, tubing and connectors: 316 stainless steel or Teflon®.

h. An anemometer and wind vane with a continuous recorder: 3 cup assembly, range 0 - 50 miles per hour, with a threshold limit of 0.75 miles per hour or less.

4. Sampling Procedure

A portable bag sampler as described in the previous section will be used to collect a surface sample from each grid, and at each evaporation pond. During sampling, the probe is to be placed approximately 2 to 3 inches above the disposal site surface. A separate gas sample of approximately 8 to 10 liters will be collected from each grid. The sampler will be set at a flow rate of approximately 333 cubic centimeters per minute and the technician will walk through a course of approximately 2,600 linear feet over a continuous 25-minute period. Other grid sizes, collection rates and walk patterns may be used if prior approval is obtained from the APCO.

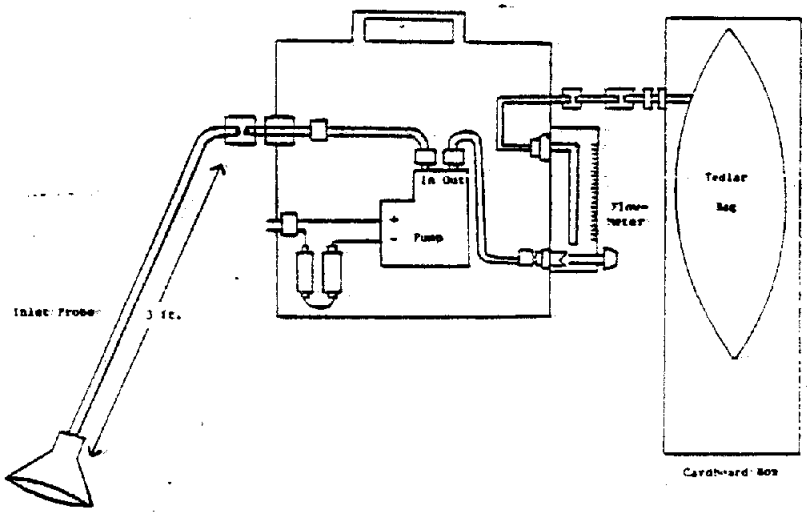

Figure 3: Integrated Surface Sampler
Source: South Coast AQMD

An anemometer and wind vane with continuous recorder will be installed at a site which is representative of the wind speeds and directions of the areas being sampled. The wind velocity should be recorded throughout the sampling period. The wind vane should be properly oriented.

5. Analytical Procedures

All bag samples collected should be analyzed within 72 hours of collection for total organic compounds and Attachment 1 compounds. The lower detection limits for these tests is listed in the "air" column of Attachment 1.

III. AMBIENT AIR MONITORING

HSC 41805.5 requires that air adjacent to disposal sites be tested and analyzed for specified air contaminants. To comply with HSC 41805.5, disposal site owners should conduct ambient air monitoring at the perimeter of the disposal site. The test should adequately characterize the contaminants in the air. The air column listed in Attachment 1 shows the lower detection limits to be achieved in parts per billion. Each disposal site should perform the ambient air sampling on three separate, not necessarily consecutive, days.

At sites where the owner has chosen to characterize only the gas above the disposal site using the integrated surface sampling technique, all specified air contaminants must be tested and analyzed for in the air samples. A site where landfill gas testing is used *and* where chloroethene (vinyl chloride) is identified in the landfill gas, then the ambient air samples need only be tested for chloroethene (vinyl chloride).

The guidelines contain three suggested procedures for testing the ambient air. These procedures were developed to cover differences in topography and climate which may occur at different sites. Each option has two parts. One addresses sites with different day and night wind patterns and one addresses sites with the same day and night wind patterns. The option chosen will depend on the results of the meteorological survey.

A. OPTION 1

1. General Procedures

HSC 41805.5 requires that air adjacent to disposal sites be tested and analyzed for specified air contaminants. If the disposal site has a gas collection system which does not operate continuously, at least one of the sampling days should be a day before the gas collection system is turned on after a typical inoperative period. This option requires twenty-four hour samples to be taken on 3 separate, not necessarily consecutive, days.

2. Meteorological Survey

A meteorological survey should be conducted prior to ambient air sampling in order to determine the local wind flow patterns which will subsequently be used to help identify the number and location of samplers required for an effective ambient air monitoring program. The operator should submit the survey to the APCO prior to ambient sampling, as part of the monitoring plan. The survey should summarize how wind flow patterns at the site will be characterized based on: previously collected on site meteorological data, data collected nearby (e.g., local airport data), proximity to water or terrain which may influence diurnal variations (e.g., daytime upslope winds, nighttime downslope, or sea breeze conditions), or a plan for on site meteorological data collection prior to ambient monitoring. In completing an on site meteorological survey prior to monitoring, wind sensors should be located nine to twelve feet above the ground and a minimum of sixty feet from obstacles such as trees, shrubbery, and buildings.

3. Ambient Air Sampling

a. General Sampling Criteria

At the completion of the meteorological survey, and on approval of the APCO, ambient air

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2. Meteorological Survey

A meteorological survey should be conducted prior to ambient air sampling in order to determine the local wind flow patterns which will subsequently be used to help identify the number and location of samplers required for an effective ambient air monitoring program. The operator should submit the survey to the APCO prior to ambient sampling, as part of the monitoring plan. The survey should summarize how wind flow patterns at the site will be characterized based on: previously collected on site meteorological data, data collected nearby (e.g., local airport data), proximity to water or terrain which may influence diurnal variations (e.g., daytime upslope winds, nighttime downslope, or sea breeze conditions), or a plan for on site meteorological data collection prior to ambient monitoring. In completing an on site meteorological survey prior to monitoring, wind sensors should be located nine to twelve feet above the ground and a minimum of sixty feet from obstacles such as trees, shrubbery, and buildings.

3. Ambient Air Sampling

a. General Sampling Criteria

At the completion of the meteorological survey, and on approval of the APCO, ambient air

sampling equipment will be installed at the appropriate locations which will be determined by:

1. Site topography,

2. Meteorological survey, and

3. Local land use patterns.

The sampling equipment should be located at or near the perimeter of the waste disposal site, in the clear and away from surrounding obstructions. The inlet probes for the ambient samplers should be located between six and nine feet off the ground (reaching height) and a minimum of sixty feet from obstacles such as trees, shrubbery and buildings. Air flow around the inlet probe should be unrestricted in an arc of at least 270 degrees with the predominant wind direction for greatest expected pollutant concentration potential included in the 270 degree arc. The sampler locations should be carefully selected to ensure the predicted prevailing wind patterns for the sampling date will come across the main body of the disposal site to the downwind station. Wind speed and direction measurements will continue to be collected throughout the ambient air sampling period to verify that the meteorological criteria are met.

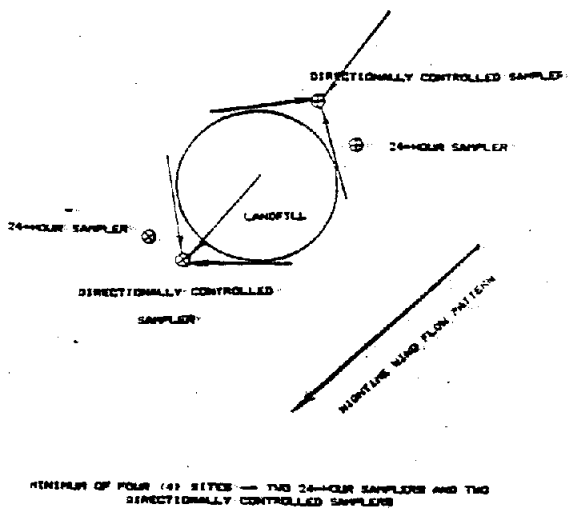

Figure 4: Option 1
Source: South Coast AQMD

Ambient air samples will be collected over a 24-hour period beginning and ending at 10:00 A.M. using the self-contained portable sampling units described in Equipment Description. In general, 24-hour and directionally controlled sampling will be required to ensure that maximum contaminant concentrations are identified for each sampling period. However, directionally controlled sampling may not be required at sites which have a constant wind direction for 24 hours. All samples will be removed from the samplers immediately after the 24-hour sampling period and analyzed for the required compounds. It is recommended that the sample be analyzed within 72 hours of collection.

b. Specific Sampling Criteria

i. At sites that experience different day and night wind flow patterns, a minimum of two 24-hour samplers and two directionally controlled samplers will be required. Twenty-four hour samplers will be placed at the upwind and downwind site perimeters based on the

prevailing wind direction. The directionally controlled sampler(s) located downwind of the disposal site should be placed at sites which will sample under the stable (drainage) wind conditions identified in the meteorological survey. The directionally controlled sampler located upwind of the disposal site should be placed near the upwind 24-hour sampler. The 24-hour samplers will operate continuously for the specified 24 hours and the directionally controlled samplers will only operate when the wind direction is within a wind sector allowing air to pass across the disposal site to the downwind sampler. This will allow the downwind directionally controlled sampler(s) to only collect air that has *passed* over the disposal site and the upwind directionally controlled sampler to only collect air that has *not passed* over the disposal site.

ii. At site that experience a constant wind direction for 24 hours, a minimum of two 24-hour samplers will be required. A 24-hour sampler will be place both upwind and downwind of the site based on the prevailing wind direction so that the upwind sampler only collects air that has *not passed* over the disposal site and the downwind sampler only collects air that has *passed* over the disposal site. Additional 24 hour samplers should be placed at locations which will sample under the stable (drainage) wind conditions identified in the meteorological survey. Since the wind direction does not change, these 24-hour samplers will act as directionally controlled samplers as well as 24-hour samplers. Comparison of the results from these samplers will provide information on ambient air quality standards and the effects the disposal site has on the ambient air quality.

4. Sampling Conditions

Ambient air sampling should be conducted on days when stable and unstable meteorological conditions are characterized by the following meteorological conditions:

a. Stable nights with average wind speeds of five miles per hour or less.

b. Daytime conditions with average wind speeds of ten miles per hour or less.

No sampling will be conducted under the following adverse meteorological conditions:

a. Precipitation

b. Twenty-four hour average wind speeds greater than ten miles per hour.

5. Equipment Description

a. Bag Sampler

1. Pump with a diaphragm made of non-lubricated Viton® rubber. The maximum pump unloaded flow rate is 4.5 liters per minute.

2. One 10-liter Tedlar® bag with a push-pull valve constructed of aluminum and stainless steel with a Viton® o-ring seal.

3. Rotameter made of borosilicate glass with a flow range of three to fifty cubic centimeters per minute. The scale is in millimeters with major graduations (labeled) every 5 mm and minor graduations every 1 mm.

prevailing wind direction. The directionally controlled sampler(s) located downwind of the disposal site should be placed at sites which will sample under the stable (drainage) wind conditions identified in the meteorological survey. The directionally controlled sampler located upwind of the disposal site should be placed near the upwind 24-hour sampler. The 24-hour samplers will operate continuously for the specified 24 hours and the directionally controlled samplers will only operate when the wind direction is within a wind sector allowing air to pass across the disposal site to the downwind sampler. This will allow the downwind directionally controlled sampler(s) to only collect air that has *passed* over the disposal site and the upwind directionally controlled sampler to only collect air that has *not passed* over the disposal site.

ii. At site that experience a constant wind direction for 24 hours, a minimum of two 24-hour samplers will be required. A 24-hour sampler will be place both upwind and downwind of the site based on the prevailing wind direction so that the upwind sampler only collects air that has *not passed* over the disposal site and the downwind sampler only collects air that has *passed* over the disposal site. Additional 24 hour samplers should be placed at locations which will sample under the stable (drainage) wind conditions identified in the meteorological survey. Since the wind direction does not change, these 24-hour samplers will act as directionally controlled samplers as well as 24-hour samplers. Comparison of the results from these samplers will provide information on ambient air quality standards and the effects the disposal site has on the ambient air quality.

4. Sampling Conditions

Ambient air sampling should be conducted on days when stable and unstable meteorological conditions are characterized by the following meteorological conditions:

a. Stable nights with average wind speeds of five miles per hour or less.

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No sampling will be conducted under the following adverse meteorological conditions:

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b. Twenty-four hour average wind speeds greater than ten miles per hour.

5. Equipment Description

a. Bag Sampler

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2. One 10-liter Tedlar® bag with a push-pull valve constructed of aluminum and stainless steel with a Viton® o-ring seal.

3. Rotameter made of borosilicate glass with a flow range of three to fifty cubic centimeters per minute. The scale is in millimeters with major graduations (labeled) every 5 mm and minor graduations every 1 mm.

4. Air flow control orifice made with 316 stainless steel capillary tubing.

5. Bypass valve.

6. Fittings, tubing and connectors made with 316 stainless steel or teflon.

7. Clock timer with an accuracy that should be better than 1%.

b. Wind directionally controlled system

1. Wind direction sensor with a vane which has a range of 0 - 540 degrees and a threshold of 1.00 mile per hour or less.

2. Controller and indicator console with an indicator range of 0 - 360 degrees and an accuracy of ± 2% of full scale.

c. Wind speed and direction monitoring with continuous recorder.

1. Anemometer three cup assembly with a range of 0-50 miles per hour and a threshold of 0.75 miles per hour or less.

2. Wind vane with a range of 0 - 540 degrees and a threshold of 1.00 miles per hour or less.

6. Wind Data Reporting

Wind data (speed and direction) will be reported as an hourly average. For example, the data collected between 1:00 P.M. and 2:00 P.M. will be averaged and reported as the 1:00 P.M. hourly average. Wind speeds will be reported in miles per hour. Wind directions will be reported using the sixteen point scale (sixteen directional points corresponding to the mariner's compass rose on which each direction is equivalent to a 22 1/2 degree sector of a 360 degree circle). For example, wind directions would be N, NNE, NE, E ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, and NNW.

B. OPTION 2

1. General Procedures

HSC 41805.5 requires that air adjacent

See Option 1.

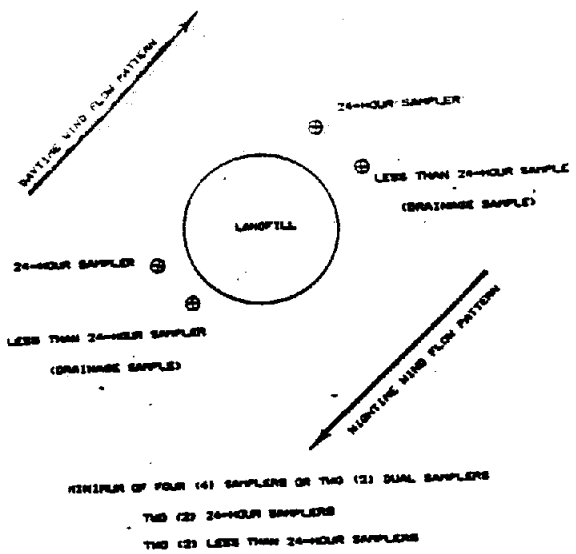

Figure 5: Option 2
Source: South Coast AQMD

to disposal sites be tested and analyzed for specified air contaminants. These guidelines require that 24-hour and less than 24-hour ambient air sampling be conducted on three different, not necessarily consecutive, days.

2. Meteorological Survey

See Option 1.

3. Ambient Air Sampling

See Option 1, Subsection 3a, General Sampling Criteria.

a. At sites that experience different but predictable day and night wind flow patterns, a minimum of two 24-hour samplers and two less than 24-hour samplers will be required. One 24-hour sampler will be placed both upwind and downwind of the site based on the prevailing wind direction. The less than 24-hour sampler(s) located downwind of the disposal site should be placed at sites to sample under the stable (drainage) wind conditions identified in the meteorological survey. The less than 24-hour sampler located upwind of the disposal site should be placed near the upwind 24-hour sampler. The start and stop times for the less than 24-hour samplers will correspond to the stable (drainage) conditions identified by analyzing the the hourly wind roses. The 24-hour samplers will operate continuously for the specified 24 hours and the less than 24-hour samplers will only operate when the wind direction is coming across the disposal site to the downwind sampler. This will allow the downwind less than 24-hour sampler(s) to only collect air that has *passed* over the disposal site and the upwind less than 24-hour sampler to only collect air that has *not passed* over the disposal site.

b. At sites that experience a constant wind direction for 24 hours, a minimum of two 24-hour samplers will be required. A 24-hour sampler will be place both upwind and downwind of the site based on the prevailing wind direction so that the upwind sampler only collects air that has *not passed* over the disposal site and the downwind sampler only collects air that has *passed* over the disposal site. Additional 24 hour samplers should be placed at locations which will sample under the stable (drainage) wind conditions identified in the meteorological survey. Since the wind direction does not change, these 24-hour samplers will act as directionally controlled samplers as well as 24-hour samplers. Comparison of the results from these samplers will provide information on ambient air quality standards and the effects the disposal site has on the ambient air quality.

4. Sampling Conditions

See Option 1.

5. Equipment Description

See Option 1.

6. Wind Data Reporting

See Option 1.

to disposal sites be tested and analyzed for specified air contaminants. These guidelines require that 24-hour and less than 24-hour ambient air sampling be conducted on three different, not necessarily consecutive, days.

2. Meteorological Survey

See Option 1.

3. Ambient Air Sampling

See Option 1, Subsection 3a, General Sampling Criteria.

a. At sites that experience different but predictable day and night wind flow patterns, a minimum of two 24-hour samplers and two less than 24-hour samplers will be required. One 24-hour sampler will be placed both upwind and downwind of the site based on the prevailing wind direction. The less than 24-hour sampler(s) located downwind of the disposal site should be placed at sites to sample under the stable (drainage) wind conditions identified in the meteorological survey. The less than 24-hour sampler located upwind of the disposal site should be placed near the upwind 24-hour sampler. The start and stop times for the less than 24-hour samplers will correspond to the stable (drainage) conditions identified by analyzing the the hourly wind roses. The 24-hour samplers will operate continuously for the specified 24 hours and the less than 24-hour samplers will only operate when the wind direction is coming across the disposal site to the downwind sampler. This will allow the downwind less than 24-hour sampler(s) to only collect air that has *passed* over the disposal site and the upwind less than 24-hour sampler to only collect air that has *not passed* over the disposal site.

b. At sites that experience a constant wind direction for 24 hours, a minimum of two 24-hour samplers will be required. A 24-hour sampler will be place both upwind and downwind of the site based on the prevailing wind direction so that the upwind sampler only collects air that has *not passed* over the disposal site and the downwind sampler only collects air that has *passed* over the disposal site. Additional 24 hour samplers should be placed at locations which will sample under the stable (drainage) wind conditions identified in the meteorological survey. Since the wind direction does not change, these 24-hour samplers will act as directionally controlled samplers as well as 24-hour samplers. Comparison of the results from these samplers will provide information on ambient air quality standards and the effects the disposal site has on the ambient air quality.

4. Sampling Conditions

See Option 1.

5. Equipment Description

See Option 1.

6. Wind Data Reporting

See Option 1.

C. OPTION 3

1. General Procedures

HSC 41805.5 requires that air adjacent to disposal sites be tested and analyzed for specified air contaminants. These guidelines require that 24-hour ambient air sampling be conducted on three different, not necessarily consecutive, days.

2. Meteorological Survey

See Option 1.

3. Ambient Air Sampling

See Option 1, Subsection 3a, General Sampling Criteria.

a. At sites that experience different day and night wind flow patterns, a minimum of three 24-hour samplers will be required. One 24-hour sampler will be placed on both upwind and downwind of the site based on the prevailing wind direction. Additional 24 hour samplers will be located downwind of the disposal site at sites which will sample under the stable (drainage) wind conditions identified in the meteorological survey. In addition, one 24-hour sampler will be placed in the vacinity of the disposal site, approximately one mile away, so it will not be affected by the disposal site emissions. This 24-hour sampler should also be approximately one mile away from other possible major emission sources so that the sample it collects will represent the background concentrations for the area. This background sampler whould be located in the clear and away

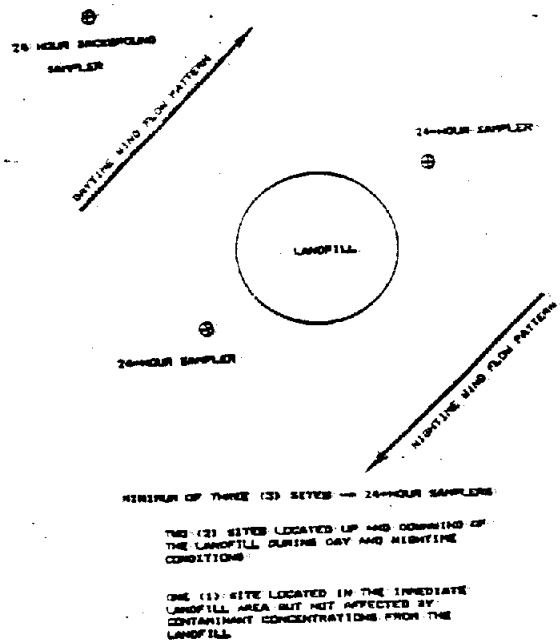

Figure 6: Option 3
Source: South Coast AQMD

from surrounding obstructions. Its inlet probe must be located between six and nine feet off the ground (breathing height) and a minimum of 60 feet from obstacles such as trees, shrubbery, and buildings. Air flow around the inlet probe must be unrestricted. All of the 24-hour samplers will operate continuously for the specified 24 hours. Comparison of the results from the samplers will provide information on the ambient air quality standards.

b. At sites that experience a constant wind direction for 24 hours, a minimum of two 24-hour samplers will be required. A 24-hour sampler will be placed both upwind and downwind

of the site based on the prevailing wind direction so that the upwind sampler only collects air that has *not passed* over the disposal site and the downwind sampler only collects air that has *passed* over the disposal site. Additional 24-hour samplers should be placed at locations which will sample under the stable (drainage) wind conditions identified in the meteorological survey. Since the wind direction does not change, these 24-hour samplers will act as less than 24-hour samplers as well as 24-hour samplers. In addition, one 24-hour sampler will be placed in the vicinity of the disposal site, approximately one mile away, so it will not be effected by the disposal site emissions. This 24-hour sampler should also be approximately one mile away from possible major emission sources so that the sample it collects will represent the background concentrations for the area. This background sampler should be located in the clear and away from surrounding obstructions. Its inlet probe should be located between six and nine feet off the ground (breathing height) and a minimum of sixty feet from obstacles such as trees, shrubbery and buildings. Air flow around the inlet probe should be unrestricted. All of the 24-hour samplers will operate continuously for the specified 24 hours.

4. Sampling Conditions

See Option 1.

5. Equipment Description

See Option 1.

6. Wind Data Reporting

See Option 1.

D. GENERIC ANALYTICAL METHODS

HSC 41805.5 directs the ARB to publish testing guidelines "specifying air contaminants to be tested for and identifying acceptable testing, analytical and reporting methods. The following generic analytical methods contain a brief description of the standard operating procedures (SOP) used by the ARB to sample and analyze specific compounds. Specific SOPs are contained in Attachment 2.

1. Method for Vinyl Chloride

Ambient samples are collected over a 24-hour period in a thirty liter Tedlar® bag using a low-volume sampler.

Samples are analyzed using chromatography with Flame Ionization or Photo Ionization Detection and preconcentration techniques. Resultant concentration peak is identified by retention times and quantified by reference to calibration standards.

2. Method for Carbon Tetrachloride, Chloroform, Ethylene Dibromide, Ethylene Dichloride, Methyl Chloroform, Methylene Chloride, Perchloroethylene, and Trichloroethylene

Ambient samples are collected over a 24-hour period in a thirty liter Tedlar® bag using a low volume sampler.

of the site based on the prevailing wind direction so that the upwind sampler only collects air that has *not passed* over the disposal site and the downwind sampler only collects air that has *passed* over the disposal site. Additional 24-hour samplers should be placed at locations which will sample under the stable (drainage) wind conditions identified in the meteorological survey. Since the wind direction does not change, these 24-hour samplers will act as less than 24-hour samplers as well as 24-hour samplers. In addition, one 24-hour sampler will be placed in the vicinity of the disposal site, approximately one mile away, so it will not be effected by the disposal site emissions. This 24-hour sampler should also be approximately one mile away from possible major emission sources so that the sample it collects will represent the background concentrations for the area. This background sampler should be located in the clear and away from surrounding obstructions. Its inlet probe should be located between six and nine feet off the ground (breathing height) and a minimum of sixty feet from obstacles such as trees, shrubbery and buildings. Air flow around the inlet probe should be unrestricted. All of the 24-hour samplers will operate continuously for the specified 24 hours.

4. Sampling Conditions

See Option 1.

5. Equipment Description

See Option 1.

6. Wind Data Reporting

See Option 1.

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2. Method for Carbon Tetrachloride, Chloroform, Ethylene Dibromide, Ethylene Dichloride, Methyl Chloroform, Methylene Chloride, Perchloroethylene, and Trichloroethylene

Ambient samples are collected over a 24-hour period in a thirty liter Tedlar® bag using a low volume sampler.

Samples are analyzed using-gas chromatography with Electron Capture Detection and preconcentration techniques. Resultant concentration peaks are identified by retention times and quantified by references to calibration standards.

3. Method for Benzene

Ambient samples are collected over a 24-hour period in a 30-liter Tedlar® bag using a low volume sampler.

Samples are analyzed using gas chromatography with photo ionization detection and preconcentration techniques. Resultant concentration peaks are identified by retention times and quantified by reference to calibration standards.

IV. GAS MIGRATION

A. General

HSC 41805.5 requires disposal site owners to test for off site underground gas migration. If the owner has chosen to use landfill gas testing, the migration testing can be limited to total organic gases as methane. If the owner chooses to use the integrated surface sampling, all the wells should be tested for total organics as methane, and the two with the highest methane concentrations should be tested for the Attachment 1 compounds.

The testing should be done at the disposal site edge in wells with spacing determined by local geology and land use near the disposal site. Any existing perimeter monitoring system can be used if it can be shown to provide the necessary data.

One perimeter sampling probe should be installed at the waste disposal site perimeter for each 1000 feet of site perimeter. The site perimeter is the outer edge of the area which is permitted to receive waste. The wells should be placed at the site perimeter between the filled area and the areas off site where gas migration would be a potential threat to public health or safety.

Samples should be taken from six feet below the surface. When the sampling wells are no longer in use, the wells should be closed using Department of Water Resources published criteria.

B. Protocol

1. Equipment Description

a. Pump with diaphragm made from non-lubricated Viton® rubber.

b. Battery to operate pump

c. Tedlar® bags

d. Various fittings

e. Flame ionization detector, or similar detector, with a lower detection limit of 2 ppm

methane.

2. Sampling Procedure

If the disposal site has a gas collection system and the system does not operate continuously, then the probes should be sampled with the system operating and immediately before the system is restarted after an off period.

a. Attach the pump to the well.

b. Attach the Tedlar® bag and take a 10 liter sample.

c. Check the sample for total organics as methane.

d. If the integrated surface sample was used, and if the methane concentration exceeds 1,000 parts per million, check the sample for the Attachment 1 compounds.

3. Data Reporting

For each sample, the owner should record:

a. Date, time, and sample location

b. Percentage of total organic compounds measured as methane using a flame ionization detector, or similar detector, with a lower detection limit of 2 ppm, and if the integrated surface sample was used, the concentrations of the Attachment 1 compounds in the two samples with the highest concentrations of methane.

c. Whether any landfill gas collection system was operating.

V. CATEGORY II SITE TESTING

Upon approval by the APCO, a site owner may perform Category II site testing. This testing is an alternative to the full testing described previously in these guidelines. The tests are designed as a screening test for sites which meet the following criteria: Filled area less than twenty-five acres, volume of waste in place less than 500,000 tons, and no occupied buildings within one thousand feet of the site perimeter. These sites are not likely to pose a health risk. Accordingly, these procedures apply so that limited resources are directed at sites which pose the most significant health risk.

The test for the Category II site consists of an emissions screening, a landfill gas sample, a limited ambient air sample, and limited off site gas migration testing. During the emissions screening, the technician walks over the disposal site using a flame ionization detector and records any readings above 50 parts per million total organics as methane. In order to characterize the landfill gas, one landfill gas sample is taken from the center of the site of at a suitable existing test well, and tested for the Attachment 1 compounds, methane, carbon dioxide, oxygen, and nitrogen. For the off site gas migration testing, four probes are installed around the disposal site and tested for total organics as methane.

To ensure that the site is adequately characterized, the Category II site will also be

methane.

2. Sampling Procedure

If the disposal site has a gas collection system and the system does not operate continuously, then the probes should be sampled with the system operating and immediately before the system is restarted after an off period.

a. Attach the pump to the well.

b. Attach the Tedlar® bag and take a 10 liter sample.

c. Check the sample for total organics as methane.

d. If the integrated surface sample was used, and if the methane concentration exceeds 1,000 parts per million, check the sample for the Attachment 1 compounds.

3. Data Reporting

For each sample, the owner should record:

a. Date, time, and sample location.

b. Percentage of total organic compounds measured as methane using a flame ionization detector, or similar detector, with a lower detection limit of 2 ppm, and if the integrated surface sample was used, the concentrations of the Attachment 1 compounds in the two samples with the highest concentrations of methane.

c. Whether any landfill gas collection system was operating.

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Upon approval by the APCO, a site owner may perform Category II site testing. This testing is an alternative to the full testing described previously in these guidelines. The tests are designed as a screening test for sites which meet the following criteria: Filled area less than twenty-five acres, volume of waste in place less than 500,000 tons, and no occupied buildings within one thousand feet of the site perimeter. These sites are not likely to pose a health risk. Accordingly, these procedures apply so that limited resources are directed at sites which pose the most significant health risk.

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To ensure that the site is adequately characterized, the Category II site will also be

required to complete the screening questionnaire in Attachment 3. The APCO will evaluate the Category II site reports, and based on a review of the information submitted, may require further testing.

A. Emissions Screening

To perform the emissions screening, the technician will need a portable flame ionization detector, or similar detector, with a lower detection limit of 2 ppm total hydrocarbons as methane and a topographic map of the disposal site. The technician will determine the background level and then walk over the disposal site surface and note all readings above 50 ppm methane.

1. Protocol

a. Stand at the upwind end of the disposal site and hold the detector probed in the clear, 10 feet off the ground. Note the reading taken after 1 minute. This is the background level.

b. Walk to the center point of the disposal site. Walk over the central acre of the disposal site in a pattern similar to that shown in Figure 2 above. The probe must be held within three inches of the disposal site surface.

c. On the map, note the location of any reading above 50 ppm methane.

B. Landfill Gas Test

The owner will perform the landfill gas test at one site in the center of the disposal site. The procedure for the landfill gas test is set out in Section II above.

C. Ambient Air Testing

The owner will perform ambient air testing by placing one ambient air sampler downwind of the disposal site and taking one twenty-four hour sample. The sample should be tested for the Attachment 1 compounds. If, however, chloroethene (vinyl chloride) was detected in the landfill gas, the ambient air sample need only be tested for chloroethene (vinyl chloride).

D. Gas Migration Testing

The owner will perform the gas migration testing as set out in Section IV above. The owner will install 1 perimeter probe for each 1000 feet of disposal site perimeter to a maximum of 4 probes. All probes will be tested for total organics as methane.

E. Screening Questionnaire

In order to adequately characterize the Category II site, the owner should also complete and submit the screening questionnaire in Attachment 3.

VI. QUALITY ASSURANCE FOR SAMPLING

A quality assurance plan for landfill gas testing should be prepared and submitted to the APCO as part of the monitoring plan. The following quality assurance tasks are listed as

an example of the information which should be included in the plan.

A. Quality Assurance Objectives

Quality assurance procedures for landfill gas testing are designed to perform two primary functions. The first is to establish the necessary quality control activities relating to sample collection, sample analysis, siting of ambient monitors, and data validation. Secondly, the plan provides for assessment of data quality in terms of precision, accuracy, and completeness.

B. Sampling Methods

Specific sampling methods will be prepared in a monitoring plan for review by the APCO. The methods should include equipment specifications, acceptance testing, sample handling and chain of custody procedures such as length of time before analysis, temperature control on samples, and shipping procedures to prevent sample loss. The monitoring plan will outline measures to protect the sampling apparatus and media from interference or damage due to rain. Use of chain of custody forms is recommended. A sample chain of custody record is attached as Appendix C. Field data sheets will be used to record sampling date and location, initials of individuals conducting sampling, analysis and data reduction, sample number, initial and final time and flow, malfunctions, leak checks, and weather conditions (e.g., rain) which could influence sample results. The initial and final flow will be averaged for the 24-hour sampling period if a flow controller is not used. Procedures for sampling with Tedlar bags, including testing, leak checking, and reuse are contained in a separate ARB document.

A site description form should be included for each monitoring site listing sampling height, distances to obstructions, and showing the monitoring location with respect to the waste site on a map with scale.

Ambient sampling precision will be calculated from at least 2 samplers collocated at a site of expected maximum concentrations. The samplers should be located between 6 and 12 feet apart. Collocated samples will be collected daily for the 3 days of ambient sampling. One sampler will be designated as the primary sampler and the others will be designated as duplicate.

C. Analysis Methods

When possible, ARB approved methods for sample preparation and analysis should be used. If modifications are necessary, the changes should be fully documented in the monitoring plan and validation testing conducted. Validation testing should provide an assessment of accuracy, precision, interferences, applicable concentration ranges, recoveries, and limits of detection of the alternative method.

Each method developed for sample analysis should be documented in a Standard Operating Procedure and be available for review by the APCO before monitoring begins. The method documentation should include the quality control activities necessary to routinely monitor data quality such as the use of control samples, field blanks, and duplicate samples. The method should also include the frequency of analysis for quality control samples. Analysis of control samples is recommended before each day of lab analysis and after every tenth sample. Control samples should be analyzed to be within control limits previously established by the laboratory performing the analysis. If results are outside the control

an example of the information which should be included in the plan.

A. Quality Assurance Objectives

Quality assurance procedures for landfill gas testing are designed to perform two primary functions. The first is to establish the necessary quality control activities relating to sample collection, sample analysis, siting of ambient monitors, and data validation. Secondly, the plan provides for assessment of data quality in terms of precision, accuracy, and completeness.

B. Sampling Methods

Specific sampling methods will be prepared in a monitoring plan for review by the APCO. The methods should include equipment specifications, acceptance testing, sample handling and chain of custody procedures such as length of time before analysis, temperature control on samples, and shipping procedures to prevent sample loss. The monitoring plan will outline measures to protect the sampling apparatus and media from interference or damage due to rain. Use of chain of custody forms is recommended. A sample chain of custody record is attached as Appendix C. Field data sheets will be used to record sampling date and location, initials of individuals conducting sampling, analysis and data reduction, sample number, initial and final time and flow, malfunctions, leak checks, and weather conditions (e.g., rain) which could influence sample results. The initial and final flow will be averaged for the 24-hour sampling period if a flow controller is not used. Procedures for sampling with Tedlar bags, including testing, leak checking, and reuse are contained in a separate ARB document.

A site description form should be included for each monitoring site listing sampling height, distances to obstructions, and showing the monitoring location with respect to the waste site on a map with scale.

Ambient sampling precision will be calculated from at least 2 samplers collocated at a site of expected maximum concentrations. The samplers should be located between 6 and 12 feet apart. Collocated samples will be collected daily for the 3 days of ambient sampling. One sampler will be designated as the primary sampler and the others will be designated as duplicate.

C. Analysis Methods

When possible, ARB approved methods for sample preparation and analysis should be used. If modifications are necessary, the changes should be fully documented in the monitoring plan and validation testing conducted. Validation testing should provide an assessment of accuracy, precision, interferences, applicable concentration ranges, recoveries, and limits of detection of the alternative method.

Each method developed for sample analysis should be documented in a Standard Operating Procedure and be available for review by the APCO before monitoring begins. The method documentation should include the quality control activities necessary to routinely monitor data quality such as the use of control samples, field blanks, and duplicate samples. The method should also include the frequency of analysis for quality control samples. Analysis of control samples is recommended before each day of lab analysis and after every tenth sample. Control samples should be analyzed to be within control limits previously established by the laboratory performing the analysis. If results are outside the control

limits, the method should be reviewed, recalibrated, and the control sample reanalyzed. Field blanks should be included with each batch of samples. The identity of field blanks and field spikes should be unknown to the analyst.

D. Calibration Procedures

The monitoring plan will specify calibration procedures including calibration intervals for recalibration, calibration standards, environmental conditions for calibrations, and a calibration record keeping system. When possible, National Bureau of Standards traceable gas standards should be used for calibration of the analytical instruments in accordance with standard analytical procedures which include multiple calibration points that bracket the expected concentrations.

If elapsed time meters are used, rather than noting beginning and ending times, the meters should be checked and calibrated to within ± 5 minutes for a 24-hour period. Samplers operated with an automatic on/off timer should be calibrated so that the sampling period is 24 hours ± 15 minutes.

Flow meters or flow controllers with critical orifices should be calibrated against a referenced flow meter at the initiation of a monitoring period.

Sampling flows should be checked in the field and noted before and after each sampling period. Before flows are checked, the sampling system should be leak checked. The initial flow should be within ± 10% if a calibrated pressure transducer is used to check flows or within ± 15% if a calibrated rotameter is used. Flow meters should be recalibrated if flows are found to be outside of these control limits.

E. Preventative Maintenance

To prevent loss of data, spare pumps and sampling materials should be kept available in the field by the operator. A schedule should be prepared for checking sampling pumps, meteorological instruments, extension cords, crimps in sampling tubing, and leaks.

F. Data Validation - Precision, Accuracy, and Completeness

Average precision and accuracy, and respective standard deviations should be calculated for the entire data set. The following equation should be used to calculate data precision.

$$P = \frac{Y - X}{X} \times 100$$

where: P = calculated data precision

Y = concentration from duplicate sampler of collocated pair;

X = concentration from primary sampler of collocated pair.

Accuracy should be determined from the performance audit of flows or spiked samples and should be calculated using the following equation:

$$A = \frac{Y - X}{X} \times 100$$

where: A = calculated data accuracy

Y = measured concentration of spiked sample or measured flow;

X = known concentration of spiked sample or known flow.

Data completeness should be calculated as a percentage of valid data compared to the total possible amount of data if no invalidations had occurred. Data will be invalidated if the power is out at a site and the length of a sample cannot be verified, or if the sampling medium breaks during sampling or shipment for analysis. Data will be corrected to reflect discrepancies in the sampling flow based on the results of a flow audit.

G. Performance Audits

For sampling with sorbent tubes, a referenced flow measuring device with a standard limiting orifice should be used to verify the indicated flows on the samplers. Flow audits should be conducted at least once during a monitoring period. Analytical audits should be conducted by spiking samples with referenced standards or by having another lab analyze split samples for comparison of results.

H. Quality Assurance Reports

Quality assurance activities and data will be summarized by the staff conducting the sampling and included as an attachment to the final data summary.

VII. TEST REPORT EVALUATION

HSC 41805.5(g) requires APCOs to evaluate the test reports. The test report data required by July 1, 1987 provides preliminary information on ambient air concentrations and landfill gas composition. If, after consulting with the Department of Health Services and the California Waste Management Board, an APCO determines that levels of tested air contaminants pose a health risk, the statute requires the district to take remedial action. Remedial action may include further ambient air monitoring, landfill gas testing, or installation of a landfill gas collection system.

If a district determines that a site poses a health risk, extended ambient air monitoring is recommended as part of the mitigation process. Additional air monitoring is also recommended at sites where the potential for public exposure or need for remedial action is uncertain. HSC 41805.5 (f) provides that districts may reevaluate the status of a site and require additional testing as necessary.

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ATTACHMENT 1

SPECIFIED AIR CONTAMINANTS

COMPOUND		Detection Limits, ppb Air	Disposal site
Chloroethene (Vinyl Chloride)	CH_2:CHCl	2	500
Benzene	C_6H_6	2	500
1,2-Dibromoethane (Ethylene Dibromide)	$BrCH_2CH_2Br$	0.5	1
1,2-Dichloroethane (Ethylene Dichloride)	$ClCH_2CH_2Cl$	0.2	20
Dichloromethane (Methylene Chloride)	CH_2Cl_2	1	60
Tetrachloroethene (Perchloroethylene)	Cl_2C:CCl_2	0.2	10
Tetrachloromethane (Carbon Tetrachloride)	CCl_4	0.2	5
1,1,1-Trichloroethane (Methyl Chloroform)	CH_3CCl_3	0.5	10
Trichloroethylene	HClC:CCl_2	0.6	10
Trichloromethane (Chloroform)	$CHCl_3$	0.8	2

ATTACHMENT 2

The choice of analytical method is left up to the individual laboratory performing the analysis. The methods provided in Attachment 2 are provided as examples of methods which can be used to sample and analyze for the specified air contaminants identified in Attachment 1. The methods are used by ARB laboratories to quantify the compounds listed *at or below the detection limits specified in Attachment 1.* Table 2-1 summarizes the method detection limits achievable by these methods and the detection limits to be reported for these guidelines:

TABLE 2-1: METHOD DETECTION LIMITS

COMPOUND	Guideline	Method Detection Limits, ppb Haagen-Smit Laboratory	Aerometric Data Division
Chloroethene (Vinyl Chloride)	2	-	1
Benzene	2	0.5	0.5
1,2-Dibromoethane (Ethylene Dibromide)	0.5	0.01	0.005
1,2-Dichloroethane (Ethylene Dichloride)	0.2	0.2	0.1
Dichloromethane (Methylene Chloride)	1	1	0.6
Tetrachloroethene (Perchloroethylene)	0.2	0.004	0.01
Tetrachloromethane (Carbon Tetrachloride)	0.2	0.02	-
1,1,1-Trichloroethane (Methyl Chloroform)	0.5	0.004	0.004
Trichloroethylene	0.6	0.005	0.02
Trichloromethane (Chloroform)	0.8	0.004	0.02

Procedure for the Sampling and Analysis of Atmospheric C_1 to C_2 Halogenated Hydrocarbons Method 103

1 Introduction

1.1 This procedure describes a method of sampling and analyzing atmospheric concentrations of C_1 to C_2 halogenated hydrocarbons in the range of 0.004 to 1.0 parts per billion (ppb).

1.2 Lower concentrations may be analyzed by increasing the sample volume and using a cryogenic trap to concentrate the sample.

1.3 Higher concentrations may be analyzed by direct injection of a diluted sample into a sample loop of a gas chromatograph.

1.4 Compounds which can be analyzed by this method are:

1.4.1 Dichloromethane, CH_2Cl_2, (methylene chloride)

1.4.2 Trichloromethane, $CHCl_3$, (chloroform)

1.4.3 1,2-Dichloroethane, $ClCH_2CH_2Cl$, (ethylene dichloride, EDC)

1.4.4 1,1,1-Trichloroethane, Cl_3CCH_3, (methyl chloroform)

1.4.5 Tetrachloromethane, CCl_4, (carbon tetrachloride)

1.4.6 Trichloroethene, $Cl_2C=CHCl$, (trichloroethylene, TCE)

1.4.7 1,2-Dibromoethane, $BrCH_2CH_2Br$, (ethylene dibromide, EDB)

1.4.8 Tetrachloroethene, $Cl_2C=CCl_2$, (perchloroethylene, PERC)

2 Method

2.1 Air is sampled into a Tedlar bag at a calibrated and controlled flow during selected time intervals as described in Appendix A, "Procedure for Atmospheric Tedlar Bag Sampling".

2.2 A measured volume of the air sample is transferred by a syringe into the chromatograph.

2.3 The components are separated by a specified column and analyzed by an electron capture detector.

2.4 An electronic integrator quantitates the halogenated hydrocarbons by integrating the peak areas and calculating concentrations from a factor determined during calibration with a halogenated hydrocarbons

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2.1 Air is sampled into a Tedlar bag at a calibrated and controlled flow during selected time intervals as described in Appendix A, "Procedure for Atmospheric Tedlar Bag Sampling".

2.2 A measured volume of the air sample is transferred by a syringe into the chromatograph.

2.3 The components are separated by a specified column and analyzed by an electron capture detector.

2.4 An electronic integrator quantitates the halogenated hydrocarbons by integrating the peak areas and calculating concentrations from a factor determined during calibration with a halogenated hydrocarbons

standard mixture.

3 Apparatus

3.1 A sampler with bags is required for each site. The sampler and bags are prepared and operated as described in the "Procedure for Atmospheric Tedlar Bag Sampling".

3.2 A gas chromatograph (GC) equipped with a gas injection valve and freeze-out trap inlet system is required. An electron capture detector is used.

3.3 One GC column is required: A glass column (6 ft x 1/4 in O.D.) packed with 0.2 percent Carbowax 1500 on Supelco 80/100 mesh Carbopac C.

3.4 Other GC supportive apparatus used are a strip chart recorder, a remote controller, and an electronic integrator.

3.5 Ground glass syringes (50, 100, and 250 mL capacity) or other suitable devices to accurately transfer air samples from Tedlar bags to the sample inlet of the GC are used.

3.6 A large air-tight chamber is used to prepare standard gas mixtures.

3.7 The cryogenic traps holding the liquid nitrogen are Dewar containers.

4 Reagents

4.1 All gases used in the GC analysis shall be of the highest commercial quality available.

4.2 Helium shall have a purity of 99.995%.

4.3 Halogenated hydrocarbons reference liquid standards, 99% purity as listed in 1.4 are used to prepare a 10 ppb working standard mixture which is used as a span gas.

4.4 A mixture of 10 percent methane in argon is used as make-up gas in the GC.

4.5 Commercial liquid nitrogen (b.p. = -196°C) is used to cool the freeze-out trap.

5 Procedure

5.1 Bags and samplers are fabricated, tested, and operated as described in Appendix B, "Procedure for the Fabrication and Testing of Sample Bags".

5.2 The air sample is analyzed for C_1 to C_2 halogenated hydrocarbons by using either the loop method or the freeze-out trap method. The freeze-out trap method is used for ppb to ppt (parts per trillion) concentrations.

5.2.1 The procedure for the loop method follows:

5.2.2 The air sample is transferred from the gas sample bag and injected into the sample loop of the GC using a clean 100 mL syringe fitted with a Luer-lok to quick-connect adapter.

5.2.3 The gas sampling valve (rotary type) is equipped with a 1 mL loop.

5.2.4 The gas sampling valve is rotated and the sample enters the GC analyzer and is separated into component compounds.

5.2.5 A Carbowax 1500/Carbopak C column is used to separate the halogenated hydrocarbons. Typical operating conditions for the gas chromatograph are:

25 mL/min helium carrier gas flow
40 mL/min 10% methane in argon make-up flow gas
80°C 10-port valve compartment temperature
150°C injection port temperature
350°C detector temperature
6° to 160°C at 8°C/min programming column temperature
Backflush: 23 min.

5.2.6 Each separated component passes through the electron capture detector and yields a response proportional to its response factor and concentration.

5.2.7 Concentrations of halogenated hydrocarbons may be calculated using an electronic integrator.

5.3.1 The procedure for the freeze-out method follows:

5.3.2 Immerse the sample trap in liquid nitrogen (LN_2) and allow the temperature to stabilize while maintaining a flow of helium through the system.

5.3.3 After discarding about 50 mL of the sample, withdraw exactly 100 mL from the sample bag with a 100 mL syringe and transfer the sample into the trap.

5.3.4 Backfill the syringe with another 40 mL of helium and flush the 40 mL through the trap; then flush the carrier helium through the trap for three minutes.

5.3.5 Isolate the cryogenic trap by using the isolation valve which allows the carrier gas to by-pass the trap.

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5.3.4 Backfill the syringe with another 40 mL of helium and flush the 40 mL through the trap; then flush the carrier helium through the trap for three minutes.

5.3.5 Isolate the cryogenic trap by using the isolation valve which allows the carrier gas to by-pass the trap.

5.3.6 Replace the LN_2 Dewar flask with a Dewar containing hot water at about 90 deg C.

5.3.7 Allow the trap to warm up.

5.3.8 Inject the sample into the carrier gas stream by turning the GC sampling valve. The gas sample enters the GC analyzer and is separated into component compounds.

5.3.9 The instrument operating conditions are the same as those described in Section 5.2.5 above.

5.3.10 Each separated component passes through the electron capture detector and yields a response proportional to its response factor and concentration.

6 Calculations

6.1 The concentrations of halogenated hydrocarbons, in ppb, are calculated by an electronic integrator using the external standard method.

6.1.1 Concentration = Area x Response Factor x Dilution Factor

6.2 The Response Factor (RF) is calculated during calibration by the equation:

$$RF = \frac{\text{Concentration}}{\text{Area}}$$

6.2.1 $$\text{Dilution Factor} = \frac{\text{Total volume of diluted sample}}{\text{Initial sample volume before dilution}}$$

6.2.2 Replicate calibrations are averaged and the arithmetic mean is stored as the RF for subsequent analyses.

6.3 Concentrations may be converted from ppb to mg/m^3 by means of the following formula:

$$mg/m^3 = \frac{P \times (M.W.) \times (ppb) \times (10^6)}{(82.05) \times (T)}$$

Where:

P	=	Pressure in atmospheres
M.W.	=	Molecular weight of corresponding halogenated hydrocarbon
82.05	=	Gas constant in cm^3 x atm./ ^oK-mole
T	=	Absolute temperature (^oK).

6.4 The concentration unit mg/m^3 is equivalent to ng/cm^3

7 Quality Control

7.1 Quality control procedures are followed in two areas: sampling and analysis.

7.2 The quality control procedures used in sampling are:

7.2.1 The Tedlar bag samplers are checked every 6 months for leakage and contamination. The interval is shortened if any malfunction is suspected. A written record is maintained of the history of each sampler. (See Appendix A).

7.2.2 The Tedlar bags are checked for leakage and contamination before being used for sampling. A log book is maintained with a complete history of bag usage. (See Appendix B).

7.3 The quality control procedures used in analyzing the samp are:

7.3.1 The accuracy of the method has not been determined.

7.3.1.1 Every six to nine months a calibration standard is prepared in a glass-lined Pfaudler Chamber maintained by the Environmental Laboratory Section of the Haagen-Smit Laboratory.

7.3.1.2 The chamber is repeatedly evacuated and flushed with zero air until it is shown by gas chromatographic analysis to be free of any significant contamination.

7.3.1.3 To prepare the standard, the chamber is re-evacuated and filled with zero air to a pressure of 5 psia.

7.3.1.4 A measured volume of a volumetrically prepared solution of halogenated hydrocarbons in methanol is injected via a heated injector into a stream of zero air as it is flowing into the chamber. The volume of the solution injected into the chamber is chosen so as to give the desired gas phase concentration of halogenated hydrocarbons when the chamber is pressurized to 16 psia with zero air.

7.3.2 Calibration standards are prepared periodically. The accuracy of the standard is verified and the procedure validated by comparing the concentration of tetrachloroethene in the chamber to that of an NBS standard.

7.3.2.1 A newly prepared chamber working standard is rejected unless the tetrachloroethene concentration based on calculation agrees within +/- 5% of the value determined by analysis, using the NBS standard for calibration.

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7.3.2.1 A newly prepared chamber working standard is rejected unless the tetrachloroethene concentration based on calculation agrees within +/- 5% of the value determined by analysis, using the NBS standard for calibration.

7.3.2.2 A newly prepared chamber working standard is rejected unless the relative response factors for all eight halogenated hydrocarbons of interest fall within +/- 10% of the historically established mean values.

7.3.3 A working chamber standard is checked at least every three months for conformity to criteria 7.3.2.1 and 7.3.2.2.

7.3.3.1 A new standard is prepared as frequently as required as determined by the above mentioned criteria.

7.3.3.2 Any reports generated after the standard ceases to be demonstratively within the established tolerances shall contain a cautionary explanation.

7.4 The gas chromatograph is calibrated periodically.

7.4.1 Calibration factors are determined on the basis of the mean values of the previous calibration runs which meet the criteria of 7.4.3.

7.4.2 Each day a calibration check is performed using the Pfaudler chamber standard to span the instrument.

7.4.3 If the response for each compound of interest is within 10% of the established calibration value, the established calibration factors are retained.

7.4.4 The calibration check is repeated if the response of the instrument has changed by more than 10% from the established values.

7.4.5 If the response is still out of tolerance, a quality assurance report is submitted, remedial action is initiated, and new calibration factors calculated.

7.4.6 Blank samples shall be analyzed daily after the calibration is completed and, whenever necessary, between samples.

7.5 The linearity of the instrument is checked periodically.

7.5.1 A gas chromatographic multipoint linearity check is performed annually with standards of at least four different concentrations and four replicate runs for each concentration. The concentrations should include the anticipated range of sample concentrations above the limit of detection.

7.5.2 The mean-square error due to lack of fit about the regression line is compared to the total mean-square error of the independent replicates about their individual means. The calibration is accepted if the F-ratio is less than the 95% rejection limit.

7.5.3 A repeated multipoint calibration should not differ from the previous calibration by more than 10%.

7.5.4 Any region of concentration that deviates more than 5% from the least-square line is considered nonlinear.

7.5.5 Data is reported only for compounds whose concentrations lie in the linear range.

7.6 Limits of detection are established.

7.6.1 The limit of detection (LOD) is based on three standard deviations (SD) of runs near the LOD (within 10 SD of the LOD, Winefordner and Long, 1983).

7.6.2 The LOD should be determined at least on an annual basis.

7.6.3 If the instrument response changes by more than 15%, the instrument must be checked and the LOD redetermined.

7.6.4 The presence in a sample of a very large adjacent peak will often raise the LOD in the sample.

7.7 Analytical instruments have quality control procedures.

7.7.1 Column conditions are checked periodically and as needed.

7.7.1.1 All GC accessible parameters is logged when a column is first installed. These parameters are checked daily and recorded on integrator reports.

7.7.1.2 The efficiency and resolution of the column are checked every month. If the tests show more than a 10% change, the column is replaced.

7.7.1.3 If the headpressure required to maintain a specified flow through the column increases by more than 100%, the column is replaced.

7.7.1.4 If the drift of retention times of peaks results in peak misidentification, all instrument parameters are checked.

7.7.2 Replicate analyses are a quality control procedure.

7.7.2.1 A duplicate analysis is performed on at least one sample per day.

7.7.2.2 If the duplicate analysis (replicate) differs by more than 20%, and if the concentration of the sample is higher than 3X LOD, then an additional analysis is performed.

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7.7.2.3 If the range of the replicate analyses is greater than the mean and if the concentration of the sample is greater than 3X LOD, the analyses are not acceptable.

7.7.2.4 If the range is within 20%, the mean and the standard deviation are reported.

7.7.2.5 If there is any reason to suspect the presence of an interferent (peak broadening, shift of retention time, shoulder formation, etc.), peak identification is verified using another analyzer (GC/MS), detector, or column.

7.7.2.6 When spiked samples are analyzed, the peak height and peak area ratios of the spiked and unspiked samples must be consistent.

7.7.3 Compound confirmation is a quality control procedure.

7.7.3.1 Ten percent of the analyses are confirmed by a different analytical system (different column or different detector, e.g. GC/MS).

7.7.3.2 If the confirmatory and the routine analyses differ by more than 20%, none of the analyses are acceptable.

7.8 Analytical reports undergo quality control procedures.

7.8.1 Data storage: raw data transmitted from the integrator are stored unmodified in electronic storage. Data are archived according to date, site, analyses, and project for easy retrieval. These data are kept for 3 years in the laboratory electronic storage.

7.8.2 All data above the minimum detection limits are reported to the requesting agency in hard copy or electronic format.

7.8.3 All reports are reviewed by at least two qualified staff before they are released.

8 Critique and Comments

8.1 Lower limits of detection have been established using the prescribed instrument conditions and using a 100 mL sample with the freeze-out trap technique.

8.1.1 Table 8.1.1 lists the lower limits of detection for the the compounds analyzed by this method.

8.2 Interferences are not usually a serious problem for light halogenated hydrocarbon analysis when the electron capture detector is used.

8.2.1 The electron capture detector is selective for the measurement of halogenated hydrocarbons. It is virtually insensitive to other hydrocarbons thus eliminating interferences from non-halogenated hydrocarbons.

8.2.2 Any halogenated hydrocarbons present in the sample having retention times very similar to the compounds of interest under the operating conditions described in this method will interfere. Therefore, proof of chemical identity requires confirmation.

8.2.3 Water vapor at normal ambient humidity in the sample does not interfere with the separation and quantification of halogenated hydrocarbons.

8.2.4 High concentrations of nitrogen oxides (500 ppm) and sulfur oxides (50 ppm) interfere in the determination of methylene chloride in the samples of stack emission sources.

8.3 The procedure described herein has both advantages and disadvantages:

8.3.1 This method provides a simple way of air sampling. The concentrations of halogenated hydrocarbons in the range of interest are stable for more than 24 hours in the bag, providing sufficient time for the analysis.

8.3.2 The sample is easily and repeatedly introduced into the instrument by means of a gas sampling valve.

8.3.3 A representative composite sample is readily obtained for any selected time interval because the air sampling flow rate is constant.

8.3.4 Both the upper and the lower limits of detection can be extended by concentrating a larger volume of the sample with a freeze-out trap or by diluting the sample in a Tedlar bag with nitrogen or by loop injection.

8.3.5 Interferences can be eliminated by selecting chromatographic conditions.

9 References

9.1 U.S. Environmental Protection Agency (1976), "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I-Principles", EPA-600/9-76-005 Environmental Monitoring and Support Laboratory, Research Triangle Park, North Carolina 27711.

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9.1 U.S. Environmental Protection Agency (19760, "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I-Principles", EPA-600/9-76-005 Environmental Monitoring and Support Laboratory, Research Triangle Park, North Carolina 27711.

9.2 Grimsrud, E. P., and Knighton, W. B., Anal. Chem. 54, 565 (1982)

9.3 Bennett, C. A., and Franklin, M. L., "Statistical Analysis in Chemistry and the Chemical Industry", John Wiley and Sons, Inc., New York, (1954), pp. 222-232.

9.4 Ullman, N. R., (1973), "Elementary Statistics", John Wiley and Sons, Inc., New York, pp. 282-298.

9.5 Winefordner, J. D. and Long, G. L., Anal. Chem. 55, 712 A (1983).

CAUTION Laboratory Operations Involving Carcinogens

Most halogenated hydrocarbons are identified as human carcinogens; therefore, appropriate precautions should be observed when handling these compounds. Do not release halogenated hydrocarbon vapors to the laboratory atmosphere at any time. When venting or purging, the vapor must be routed to outside air. The OSHA regulations pertaining to the use and handling of halogenated hydrocarbons are published in Title 29 of the Code of Federal Regulations available in the Federal Register, Volume 40, May 28, 1975, pp. 23073.

TABLE 8.1.1
LIMITS OF DETECTION

Compound	Limit of Detection ppb	Concentration ppb	Mean Area	Area St.Dev.	n	% Rel St.Dev
Methylene Chloride	1	1.37	8,230	800	6	9.7
Chloroform	0.004	0.006	8,290	197	5	2.4
Methyl Chloroform	0.004	0.004	34,000	3600	5	10.6
Carbon Tetrachloride	0.02	0.028	13,900	676	5	4.9
		0.01	2,400	320	6	13.3
Trichloroethylene	0.005	0.0064	15,600	515	5	3.3
Ethylene Dibromide	0.01	0.009	3,150	430	5	[illegible]7
Perchloroethylene	0.004	0.0047	102,700	6080	5	5.9
Ethylene Dichloride	0.2	0.3	61,778	4811	6	7.8
		0.09	26,677	2143	5	8

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Ethylene Dibromide	0.01	0.009	3,150	430	5	[illegible]
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Procedure for the Sampling and Analysis of Atmospheric Benzene Method 102

1 Introduction

1.1 This procedure describes a method of sampling and analyzing atmospheric concentrations of benzene in the range of 0.5 to 1000 parts per billion (ppb).

1.2 Lower concentrations may be analyzed by increasing the sample volume and using a cryogenic trap to concentrate the sample.

1.3 Higher concentrations may be analyzed by direct injection of a sample into a sample loop of a gas chromatograph.

2 Method

2.1 Air is sampled into a Tedlar (polyvinyl fluoride) bag at a constant rate (30 to 40 mL/min) during selected time intervals by means of an automatic sampler.

2.2 After sampling, the ambient air bag sample is returned to the laboratory for analysis.

2.3 The sample is introduced into the gas chromatograph (GC) sample stream by means of gas injection valves and analyzed by a photoionization detector.

2.4 The GC data system quantitates benzene by integrating the peak area and calculating the concentration from factors determined during calibration with standards.

3 Apparatus

3.1 The sampler system consists of a diaphragm pump with a by-pass flow constrictor, a solenoid valve, a flow meter with a flow control valve, pressure regulator, fittings, and tubing to convey air samples to the Teflon bag. The entire assembly, including a 7-day timer and associated electrical circuitry to control the filling of the sample bags, is compactly mounted on a metal chassis and operates on a 110 VAC power supply.

3.2 Tedlar bags, 2 mil thickness, 50 liter capacity, equipped with stainless steel quick disconnect fittings are used to contain the sample. The bags are prepared in conformity with the ARB document, "Procedure for Fabrication and Testing of Sample Bags", (see Appendix B). For sampling the bags are placed in rigid opaque containers to protect their contents from the sunlight.

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3.3 A gas chromatograph equipped with a gas sampling valve and either a sample loop or freeze-out inlet system and a photoionization detector is required. The detector operates at 10.2 eV.

3.4 A freeze-out system consisting of a U-shaped stainless steel trap filled with stainless steel clippings is used to concentrate the sample.

3.5 A stainless steel column (6 ft x 1/8 in) packed with 10% N,N-bis(2-cyanoethyl)formamide on 100/120 mesh Chromosorb PAW is used.

3.6 For a confirmation of the benzene analysis, an alternate column should be used such as a stainless steel GC column packed with 10% tricyanoethoxy propane (TCEP).

3.7 An analog recorder and an electronic integrator to quantify peak areas are required.

3.8 Ground glass syringes (100 mL capacity) or other suitable devices are needed to transfer air samples from the Tedlar bag to the GC sample inlet.

4 Reagents

4.1 The primary standard used in this analysis should be the National Bureau of Standards (NBS) benzene standard reference material.

4.2 Helium with a minimum purity of 99.995% should be used.

4.3 Commercial liquid nitrogen (b.p.=-196°) is used to cool freeze-out trap.

5 Procedure

5.1 All bags and samplers are prepared for sampling as outlined in Appendix A, "Procedures for Atmospheric Bag Sampling".

5.2 The air sample is analyzed for benzene by using either the loop method or the freeze-out method. The freeze-out method is used for lower benzene concentrations of less than 25 ppb.

5.2.1 The procedure for the loop method follows:

5.2.1.1 Transfer the air sample from the air sample bag and inject it into the sample loop of the gas chromatograph using a 100 mL syringe fitted with a Luer-lok to quick-connect adapter.

5.2.1.2 The gas sampling valve has a fixed volume sample loop of about 1 mL.

5.2.1.3 Rotate the gas sampling valve. This causes the sample to enter the gas chromatographic analyzer.

5.2.2 The procedure for the freeze-out method follows:

5.2.2.1 Immerse the sample trap in liquid nitrogen (LN_2) and allow the temperature to stabilize (approximately 5 min).

5.2.2.2 After flushing the syringe with about 40 mL of the sample withdraw exactly 40 mL from the sample bag with the syringe.

5.2.2.3 Transfer the sample into the trap.

5.2.2.4 Backfill the syringe with 40 mL of helium and flush the 40 mL through the trap; then flush helium through the trap for 2 minutes at 100 mL/min.

5.2.2.5 Stop the helium flushing process.

5.2.2.6 Isolate the cryogenic trap by using the isolation valve, which prevent the escape of the sample.

5.2.2.7 Remove the LN_2 Dewar from the trap and replace it with a Dewar containing hot water at about 80 degC.

5.2.2.8 Allow the trap to warm up.

5.2.2.9 Actuate the sampling valve, thereby causing the carrier gas stream to flush the sample into the gas chromatograph.

5.3 With the suggested stainless steel column (see item 3.5), typical operating conditions for both loop and freeze-out methods are:

Helium flow:	20 mL/min
Heating bath temperature for cryogenic trap:	80 degC
Column temperature:	ambient
Detector temperature:	150 degC

5.4 Concentrations of benzene may be calculated by using a chromatographic data system or any other suitable electronic integrating device.

6 Calculation

6.1 The benzene concentration in ppb is calculated by the data system using the external standard method:

Concentration = Area x Calibration Factor

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6 Calculation

6.1 The benzene concentration in ppb is calculated by the data system using the external standard method:

Concentration = Area x Calibration Factor

6.2 The calibration factor (CF) is calculated during calbration by the equation,

$$CF = \frac{conc}{Area}$$

The replicate calibrations are averaged and the arithmetic mean is stored as the CF to be used in subsequent analyses.

6.3 Concentrations may be converted from ppb to ug/m^3 by using the following formula:

$$ug/m^3 = \frac{(P) \times (MW) \times (ppb) \times (10^3)}{(82.05) \times (T)}$$

where: P = pressure in atmospheres

MW = molecular weight of benzene, 78.11 g/mole

82.05 = gas constant, $\frac{cm^3 \times atm}{mol \times T}$

T = absolute temperature, degK

7 Quality Control

7.1 Quality control procedures are managed in two areas: sampling and analysis.

7.2 The sampling procedures use the following protocol:

7.2.1 The Tedlar bag samplers are checked every six months for leakage and contamination. The interval is shortened if any malfunction is suspected. A written record is maintained of the history of each sampler. (See Appendix A).

7.2.2 The Tedlar bags are checked for leakage and contamination before being used for sampling. A log book is maintained with a complete history of bag usage. (See Appendix B).

7.3 The analytical procedures use the following protocol:

7.3.1 Calibrations are performed periodically. Accuracy of the method cannot be determined without an accepted standard reference material (SRM) and independent accuracy evaluation.

7.3.1.1 An NBS traceable reference material of 0.25 ppm (parts per million) benzene in nitrogen is used to monitor

the concentration of a secondary working standard.

7.3.1.2 Any secondary standards prepared from the reference standard must show the same response factor as the original reference standard. Intercomparisons are made on a monthly basis.

7.3.1.3 A working standard, prepared by diluting an NBS reference material of about 10 ppm to about 10 ppb, is generally used for daily calibrations.

7.3.1.4 The stability of working standards must be such that there is less than a 10% change in thirty days.

7.3.1.5 There shall be at least one working standard whose concentration lies within the interval of 5 to 20 ppb.

7.3.1.6 A second working standard of a higher concentration shall be prepared for use in two point calibrations.

7.3.1.7 A quality assurance audit of the standards is prepared annually.

7.3.2 Calibrations are performed on a daily schedule.

7.3.2.1 The daily calibration consists of at least two calibration points bracketing the anticipated sample concentrations.

7.3.2.2 The calibration is repeated if either the slope or the response at the limit of detection (LOD) of the fitted line changes by more than 5%. If the calibration fails on both runs, an NBS 0.25 ppm reference standard is used to validate the calibration.

7.3.2.3 If the lamp voltage is adjusted, allow time for the lamp to stabilize and repeat the calibration.

7.3.2.4 A record is kept of the lamp voltage settings and all preventative maintenance procedures i.e. lamp replacements, cleaning of lamp windows.

7.3.2.5 Blank samples are run daily between calibrations and sample analyses as necessary.

7.3.2.6 A single point span calibration may be substituted for the two point calibration procedure for a maximum of four consecutive days provided the response factor does not change by more than 10% during the time interval.

7.3.3 Linearity is a factor that is checked periodically.

7.3.3.1 A gas chromatographic linearity check is performed annually with standards of at least 4 different con-

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7.3.3 Linearity is a factor that is checked periodically.

7.3.3.1 A gas chromatographic linearity check is performed annually with standards of at least 4 different con-

centrations and 4 replicate runs for each concentration. The concentrations must bracket the anticipated range of sample concentrations.

7.3.3.2 The mean-square error due to lack of fit about the regression line is compared to the total mean-square error of the independent replicates about their individual means. The calibration is accepted if the F-ratio is less than the 95% rejection limit.

7.3.3.3 Any region of concentration that deviates more than 5% from the least square line is considered nonlinear.

7.3.3.4 Samples must be analyzed only in the linear range.

7.3.4 Limits of detection must be established.

7.3.4.1 The limit of detection (LOD) is based on three standard deviations (SD) of runs near the LOD (within 10 SD of the LOD, Winefordner and Long, 1983).

7.3.4.2 The LOD should be determined at least on an annual basis.

7.3.4.3 If the benzene calibration factor changes by more than 10%, The instrument must be checked and the LOD redetermined.

7.3.4.4 The presence in a sample of a compound producing in the chart display very large adjacent peaks will often raise the LOD in that sample.

7.3.5 GC column condition parameters should be checked and documented.

7.3.5.1 All GC accessible parameters should be logged when a column is first installed. These parameters should be checked daily and recorded on integrator reports.

7.3.5.2 The efficiency and resolution of the column should be checked every thirty days. If the tests show more than a 10% change the column needs replacement.

7.3.5.3 If the headpressure required to maintain a specified flow through the column increases by more than 100%, the column needs replacement.

7.3.5.4 If the drift of retention times of the peaks results in peak misidentification, all instrument parameters need to be checked.

7.3.6 Replicate analyses are performed regularly.

7.3.6.1 A duplicate analysis is performed on at least one sample each day.

7.3.6.2 If the duplicate analysis differs by more than 20%, and if the concentration of the sample is higher than 3X LOD, then an additional analysis is needed.

7.3.6.3 If the relative standard deviation (RSD) of the replicate analyses is greater than 15% and if the concentration of the sample is greater than 3 x LOD, none of the analyses for that day are acceptable.

7.3.6.4 If the range is within 20%, the mean and the standard deviation are reported.

7.3.7 Compound confirmation is a quality control procedure.

7.3.7.1 Ten percent of the analyses are to be confirmed by a different analytical system (different column or alternate detector, e.g. GC/MS).

7.3.7.2 If the confirmatory and the routine analyses differ by more than 20%, none of the analyses for that day are acceptable.

7.3.8 Analytical reports are filed.

7.3.8.1 Data storage: peak area and compound concentration data are stored unmodified in the electronic storage. Data are archived according to date, site, analysis, and project for easy retrieval. These data are kept for three years in the laboratory electronic storage.

7.3.8.2 All data above the minimum detection limits are reported to the requesting agency in hard copy or electronic format.

7.3.8.3 All reports are reviewed by at least two qualified staff before they are released.

8 Critique and Comments

8.1 The minimum measurable concentration of benzene has been determined to be 0.5 ppb using prescribed instrument conditions i.e. 40 mL sample, cryogenic trap.

8.1.1 Table 8.1.1 lists the lower limits of detection for the method and its associated statistics

8.2 The range of benzene measurement is 1.0 to 1000 ppb. The upper limit may be expanded by extending the calibration range, by diluting the sample, or by reducing the sample volume.

8.3 Any organic compound present in the sample having a retention time similar to that of benzene under the

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8.3 Any organic compound present in the sample having a retention time similar to that of benzene under the

operating conditions described in this method may interfere with the quantification. Proof of chemical identity for benzene requires confirmation by other means.

8.3.1 Benzene is positively identified by means of a gas chromatograph/mass spectrometer.

8.4 Advantages and disadvantages of Method 102 are listed below:

8.4.1 The air sampling equipment is easily set up and involves no liquids. The ambient concentrations of benzene are are stable for at least 24 hours in the Tedlar sampling bags if the sampling bags are kept away from direct sunlight and are not exposed to temperatures greater than 90°F.

8.4.2 A representative integrated sample is readily attainable because the equipment samples at a constant rate.

8.4.3 The sample is easily and repeatedly introduced into the GC by using a volumetric gas sampling valve or cryogenic trap.

8.4.4 The lower concentration limit of the analysis may be extended by concentrating the sample by freezing out a larger volume of the sample.

8.4.5 The polyvinyl fluoride (Tedlar) film sample bag is susceptible to leaks and permeation through the bag.

8.4.6 The sample is susceptible to contamination when it passes through the sampling system.

9 References

9.1 Bennett, C. A. and Franklin, N. L., "Statistical Analysis in Chemistry and the Chemical Industry", pp. 222-232, John Wiley & Sons, Inc., New York (1954).

9.2 Draper, N. R. and Smith, H., "Applied Regression Analysis", p.30, John Wiley & Sons, Inc., New York (1966).

9.3 Purnell, H., "Gas Chromatography", pp. 301-302, John Wiley & Sons, Inc., New York (1962).

9.4 U. S. Environmental Protection Agency, "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume I - Principles", Research Triangle Park, North Carolina 27711 (1976).

METHOD NO. ADDL002

STANDARD OPERATING PROCEDURE FOR THE DETERMINATION OF VOLATILE ORGANICS IN AMBIENT AIR USING TENAX TRAP PRECONCENTRATION GAS CHROMATOGRAPHY AND TANDEM PHOTOIONIZATION/ELECTRON CAPTURE DETECTORS

1.0 SCOPE

This document describes a procedure for the determination of volatile halogenated hydrocarbons and aromatics having a boiling point of less than 120°C. This procedure is based on documents received from the ARB Haagen-Smit Laboratory, El Monte, as well as EPA Method TO1.

2.0 SUMMARY OF PROCEDURE

Ambient air is continuously sampled and collected in a Tedlar bag over a 24 hour period and immediately sent to the laboratory for analysis. A sample from the bag is drawn through a sampling valve attached to a Tekmar LSC-2 Tenax Sample Concentrator (see Figure I) with a vacuum pump at 50 cc/min for four minutes (total sample volume: 200 cc). The organic constituents are trapped on Tenax and when the collection is complete, the Tenax is purged with 40 cc of helium to remove any trapped moisture. The sample is then thermally desorbed onto the head of the GC column. The GC column is temperature programmed and component peaks

eluting from the column are sequentially detected and quantified, first by a photoionization detector (PID) and then by an electron capture detector (ECD). The components are identified based on retention times. Positive identification or confirmation requires the use of an appropriately configured GC/MS.

3.0 INTERFERENCES/LIMITATIONS

a. Components having similar GC retention times will interfere, causing misidentification and/or faulty quantitation.

b. Because of the very low sample concentrations, extreme care must be taken to insure that the sample is not degraded or contaminated by the Tedlar sampling bag, sampling apparatus, or delayed delivery to the laboratory. Exposure of the Tedlar sampling bag to temperatures greater than 25°C should be minimized.

c. Only components of the sample which can be detected by PID/ECD detectors will be quantified.

4.0 APPARATUS

a. Varian Model 6000 Gas Chromatograph/PID/ECD system equipped with a Varian Vista 402 dual channel data system.

b. Tekmar LSC-2 Sample Concentrator equipped with Tenax trap and sampling valves as shown in Figure 1.

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a. Varian Model 6000 Gas Chromatograph/PID/ECD system equipped with a Varian Vista 402 dual channel data system.

b. Tekmar LSC-2 Sample Concentrator equipped with Tenax trap and sampling valves as shown in Figure 1.

c. Matheson Model 8240 Mass Flow Controller accurately calibrated in the 5-100 cc/min range.

d. Laboratory timer, accurate to within 0.1 minutes.

e. Gas tight microliter syringe, 50 ul.

f. GC column - 10' x 2 mm i.d. glass column packed with 1 percent SP-1000 on Carbopack B, 60/80 mesh.

5.0 REAGENTS

a. Primary Gas Standard (Scott Specialty Gases - Research Triangle Institute Certified Series 1)

Compound	Concentration (ppb)
Chloroform	107
Carbon tetrachloride	105
Perchloroethene	106
Vinyl chloride	104
Benzene	107

b. Primary Gas Standard (Scott Specialty Gases - Research Triangle Institute Certified Series 2)

Compound	Concentration (ppb)
1,2-Dichloroethane	101
1,1,1-Trichloroethane	98
Trichloroethene	100
1,2-Dibromoethane	102

c. Stock Gas Standard - Scott-Marrin Blend (assayed against primary cylinders)

Compound	Concentration (ppb)
Dichloromethane	4272
Chloroform	528
1,2-Dichloroethane	3104
1,1,1-Trichloroethane	424
Carbon tetrachloride	46
Trichloroethene	336
1,2-Dibromoethane	5
Perchloroethene	43
Vinyl chloride	4736
Benzene	1888

b. Primary Gas Standard (Scott Specialty Gases - Research Triangle Institute Certified Series 2)

Compound	Concentration (ppb)
1,2-Dichloroethane	101
1,1,1-Trichloroethane	98
Trichloroethene	100
1,2-Dibromoethane	102

c. Stock Gas Standard - Scott-Marrin Blend (assayed against primary cylinders)

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Carbon tetrachloride	46
Trichloroethene	336
1,2-Dibromoethane	5
Perchloroethene	43
Vinyl chloride	4736
Benzene	1888

d. Control Gas Standard - Scott-Marrin Blend (assayed against primary cylinder)

Compound	Concentration (ppb)
Dichloromethane	6
Chloroform	0.2
1,2-Dichloroethane	0.2
1,I,1-Trichloroethane	3.6
Carbon tetrachloride	0.3
Trichloroethene	1.8
1,2-Dibromoethane	2.5
Perchloroethene	1.2
Vinyl chloride	3.3
Benzene	4.8

e. Surrogate Gas Standard (Scott-Marrin Blend)

Compound	Concentration (ppm)
Bromochloromethane	10
1,3-Bromochloropropane	33

6.0 PROCEDURES

a. Sample Trapping

1. The preconcentration system is shown in Figure 1.

2. The high concentration inlet is used for high concentration calibration standards and for other samples with concentrations higher than ambient levels. The sample is introduced through the high concentration inlet and 6 port valve into an appropriate size loop of known volume. The sample then passes through a 10 port valve, mass flow meter, and vacuum pump. Before an analysis, the system is leak checked by blocking the sample inlet port and observing that the mass flow meter reading drops to zero. The high concentration inlet then is connected to a Tedlar sample bag valve and the gas bag valve is opened. The loop is then flushed with sample gas for three minutes. After three minutes of flushing, the 6 port valve is reset so that the sample contained in the loop is carried into the trap by the helium purge gas. This continues for three minutes to ensure that all of the contents of the loop are trapped.

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3. Ambient samples are introduced from Tedlar bags as described above, except that the sample loop is bypassed and the sample goes directly to the 10 port valve. After flushing the system with sample for three minutes, the 10 port valve is reset so that 200 cc's of sample is trapped (50 cc/min. for four minutes). After sample trapping is complete, the Tenax trap is flushed with 40 cc of helium to remove water vapor and any nonadsorbed reactive gases.

4. In both ambient and high concentration cases, after the sample has been trapped, the Tekmar LSC-2 heats the Tenax trap to 180°C while the trap is swept with the G.C.'s internal carrier gas for four minutes. The contents of the trap are thus desorbed and collected on the head of the G.C. column. The trap is baked out after the end of the desorption cycle. In the bakeout cycle, the trap is flushed with helium purge gas for eight minutes while being held at 225°C in order to prepare the trap for the next cycle. After bakeout the trap is isolated from the system and ready for the next sample.

b. Analysis

1. The concentrated sample is separated under the chromatographic condition detailed below. The resulting chromatogram (see Figure II) is then integrated and quantified by reference to calibration standard gases.

2. Instrument Conditions:

GC: Column: 10' x 2 mm i.d. glass column, packed with 1 percent SP-1000 on Carbopack B 60/80 mesh

Temperatures: Injection: 200°C
Detector: 350°C
Oven: 45°C, hold for four minutes, 5°C/min ramp, to 210°C, hold for eight minutes

Flow Rates: Carrier: He, 20 cc/min
ECD make up: N_2, 40 cc/min

Detectors: ECD: Range X 10, Attenuation X 32
PID: Range X 1, Attenuation X 32, 10.2 ev lamp

Conc: Tekmar LSC-2: Purge: 4 minutes
Desorb: 4 minutes at 180°C
Bake: 8 minutes at 225°C

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Detector: 350°C

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ECD make up: N_2, 40 cc/min

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PID: Range X 1, Attenuation X 32, 10.2 ev lamp

Conc: Tekmar LSC-2: Purge: 4 minutes

Desorb: 4 minutes at 180°C

Bake: 8 minutes at 225°C

3. All blanks, standards, control samples, and ambient samples are spiked with surrogate compounds by injecting 50 microliters of the surrogate gas standard (5.e.) during sample trapping. The surrogate compounds, chosen such that they simulate the characteristics of the analytes of interest and are unlikely to occur in the environment, are added to insure that systematic errors or equipment failures will be noted and corrected promptly.

4. The first step in a calibration is to analyze a system blank. This is done by trapping and analyzing a 200 cc sample of auxiliary carrier gas. The system blank must be free of interfering peaks. A system blank must also be run after a high concentration sample is analyzed in order to detect any carry-over within the system.

5. A calibration is performed using a 1.25 cc loop of stock standard gas (5.c.). Two hundred cubic centimeters of helium gas is passed through the loop to carry the standard onto the trap. The calibration analysis is made as a normal analysis. The calculated concentration value for each component should be inspected to insure consistency with previous analyses. The stored chromatographic information may then be used to recalculate the response factors for the subsequent analyses. The G.C. data system will not accept updated response factors which are in excess of plus or minus 15 percent of historic data.

6. Following calibration, 200 cc of the control sample (5.d.) is concentrated on the trap and analyzed. The control sample data are plotted on control charts of the normal Shewhart type. Upper and lower warning limits are plus or minus two times the standard deviation. Any analysis which falls outside the upper and lower warning limits is repeated and the laboratory quality control officer is advised. Upper and lower control limits are plus or minus three times the standard deviation. If any analysis falls outside the upper or lower control limit, the method is discontinued until the out of control situation is remedied. The laboratory quality control officer is advised and provided with written documentation of the out of control condition and how it was remedied. All data generated prior to the out of control situation must be reviewed for possible decertification by laboratory management.

7. Multipoint calibrations are conducted monthly. Each multipoint calibration includes a trap blank and three standard concentration levels to bracket the concentration ranges expected in ambient air. If subsequent data indicate that the resulting least squares analyses are consistently acceptable, less frequent multipoint calibrations may be made.

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7.0 PERFORMANCE

a. All ambient field samples are analyzed in duplicate. The relative error between analyses must be less than 20 percent. Duplicate analyses having greater than 20 percent relative error must be decertified.

b. The percent recovery of the surrogate is recorded in the instrument laboratory workbook for each analysis. If this value is outside the 80% to 120% range, the sample analysis must be repeated.

8.0 METHOD SENSITIVITY, PRECISION AND ACCURACY

The method sensitivity, precision and accuracy are outlined in Table I. These data were produced with gaseous calibration standards, and using carrier gas as the sample matrix. The relative accuracy of the method, with the exception of dichloromethane, is based on reference to the Research Triangle Institute Certified Gas Standards (NBS traceable). Authoritative reference calibration standards for dichloromethane are under development at NBS but are not yet available. The concentration value of the present standard was assigned by the commercial manufacturer and found to be in good agreement with diluted pure dichloromethane prepared in our laboratory. The absolute accuracy of the method has not been determined by interlaboratory testing.

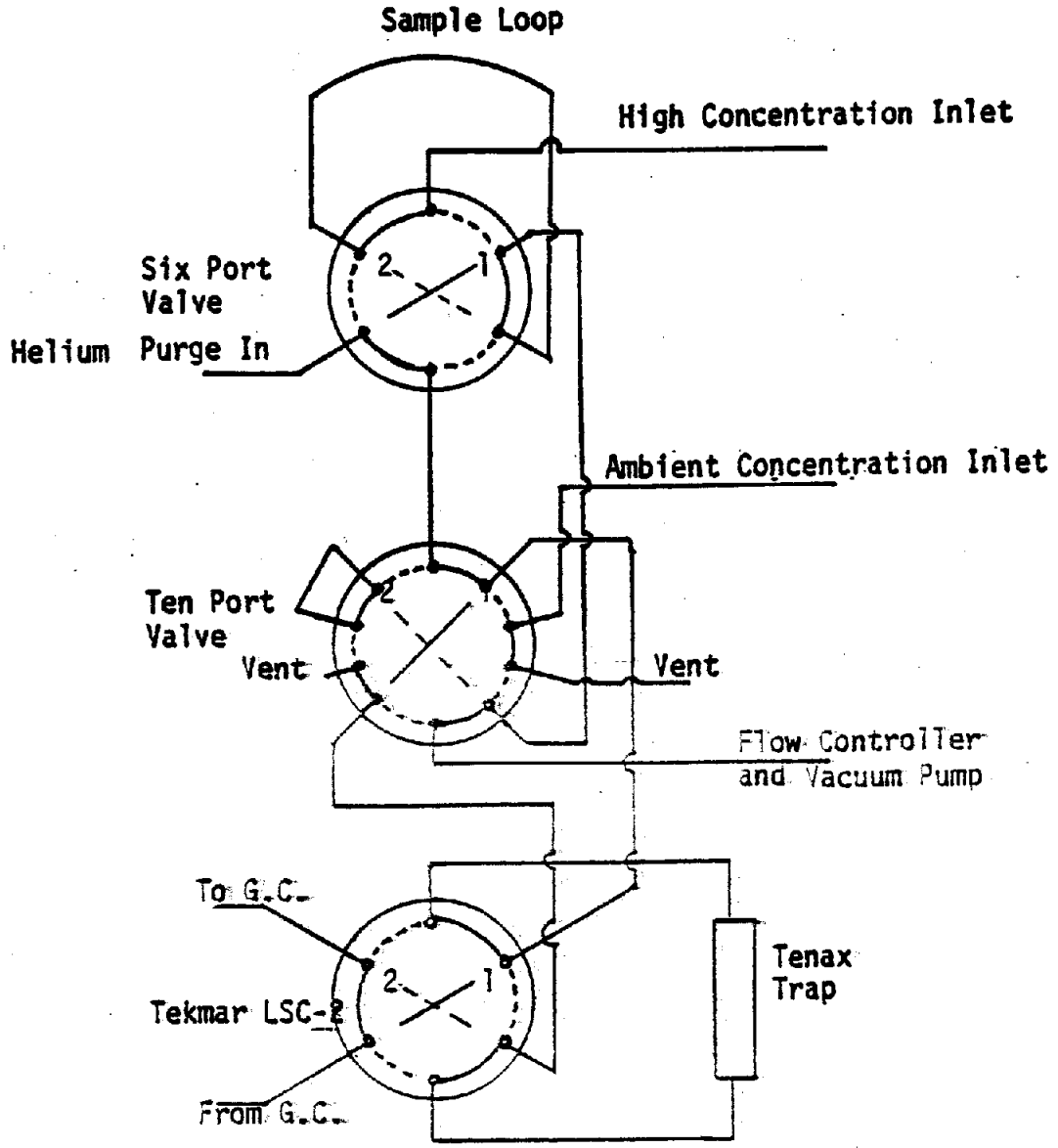
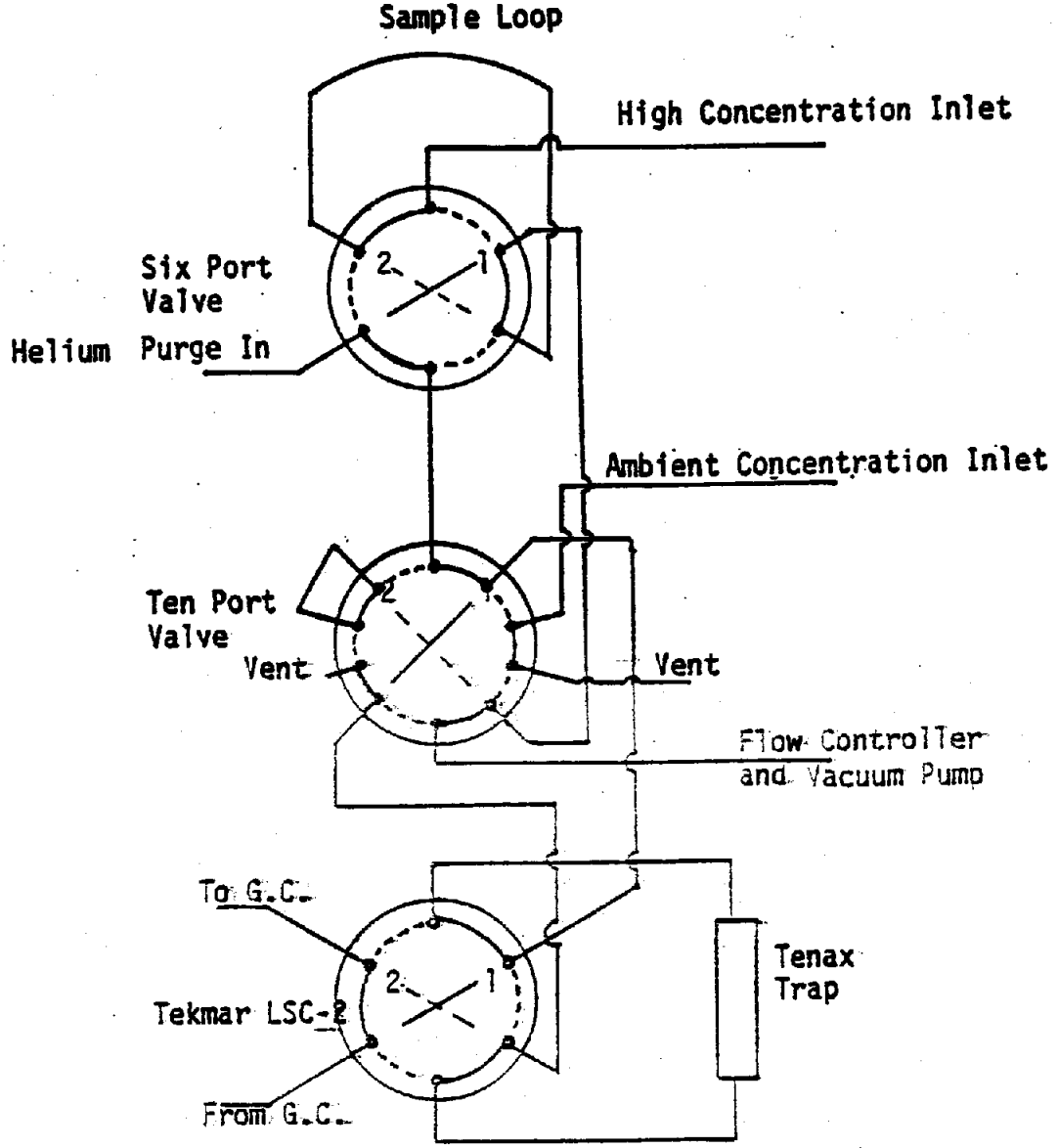


Figure 1. Schematic of concentrator system. Sampling Conditions are: 200 cc volume, purge at 40cc/min, 1 min., desorb at 180 C for 4 min., bake for 8 min. at 225 C.

SYSTEM GUIDE

Operational Step	Valve Position			
	6-Port	10-Port	LSC-2	Purge Gas
Loop Fill	1	1	1	Off
Loop Trap	2	1	1	On
Ambient Trap	1	2	1	Off
Trap Desorb	1	1	2	Off
Trap Bake Out	1	1	1	On



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Trap Desorb	1	1	2	Off
Trap Bake Out	1	1	1	On

PRELIMINARY DRAFT

DATE_____ SIGNATURE_____

STATE OF CALIFORNIA
AIR RESOURCES BOARD
AEROMETRIC DATA DIVISION LABORATORY

Method For Determination Of Benzene, Xylenes, Toluene And Ethyl Benzene In Ambient Air Using Tenax Preconcentration And Gas Chromtography/Photoionization Detection

Introduction

This document describes a packed column GC/PID method to separate and quantitate the o-, m-, and p-xylene isomers plus benzene, toluene and ethyl benzene in ambient air samples. This method consists of preconcentrating ambient air samples using a Tenax trap and then thermally desorbing the components onto a packed glass column for analysis by PID. Air-actuated valves and data processing using a data system make this a highly automated system.

Apparatus

1. Varian Model 6000 Gas Chromatograph/HNu photoionization detector (GC/PID) system equipped with a Vista 402 Data System.

2. A sampling and analysis valve system consisting of a 6-port and 4-port valve, 1/8" x 6" Ni trap filled with 60/80 mesh Tenax and an injection system for standards as shown in Figure 1.

3. Matheson Model 8240 Mass Flow Controller accurately calibrated in the 5-100 cc/minute range and a Metal Bellows Pump for sampling.

4. Gas-tight microliter syringes with on/off valves for injection of standard gas mixtures.

Reagents and Standards

1. SRM-1806 benzene 10 ppm in nitrogen standard.

2. Chemical standards of highest purity available.

3. Methanol ACS grade.

4. Stock solutions for standards.

Table I

Method Sensitivity and Precision

Compound	Correlation Coefficient	Slope	R.S.D* (Percent)	Detector	LOD ppbv
Vinyl Chloride	0.997	0.946	16	PID	0.8
Dichloromethane	0.999	0.975	5	ECD	0.6
1,1-Dichloroethylene	0.991	0.966	6	ECD	0.05
Chloroform	0.999	0.901	3	ECD	0.02
1,2-Dichloroethane	0.999	1.054	7	ECD	0.1
1,1,1-Trichloroethane	0.999	0.989	9	ECD	0.01
Carbon Tetrachloride	0.999	0.980	6	ECD	0.005
Trichloroethylene	0.999	0.992	6	ECD	0.02
Benzene	0.998	0.950	10	PID	0.5
1,2-Dibromoethane	0.974	1.067	9	ECD	0.005
Tetrachloroethylene	0.994	1.080	10	ECD	0.01

* R.S.D. - Relative Standard Deviation at 5 x LOD, n = 5

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1,1-Dichloroethylene	0.991	0.966	6	ECD	0.05
Chloroform	0.999	0.901	3	ECD	0.02
1,2-Dichloroethane	0.999	1.054	7	ECD	0.1
1,1,1-Trichloroethane	0.999	0.989	9	ECD	0.01
Carbon Tetrachloride	0.999	0.980	6	ECD	0.005
Trichloroethylene	0.999	0.992	6	ECD	0.02
Benzene	0.998	0.950	10	PID	0.5
1,2-Dibromoethane	0.974	1.067	9	ECD	0.005
Tetrachloroethylene	0.994	1.080	10	ECD	0.01

* R.S.D. - Relative Standard Deviation at 5 x LOD, n = 5

Stock solutions are prepared by dilution of pure chemicals into methanol. The following volumes are diluted to 50 ml using a volumetric flask.

Compound	Stock Standard ul/50 ml	Gas Standard-ppmv (10 ul/250 cc)	Trap Standard-ppbv (50 ul/200 cc)
Benzene	182	40	10
Toluene	217	40	10
Ethyl benzene	250	40	10
o-xylene	246	40	10
m-xylene	251	40	10
p-xylene	252	40	10

A 10 ul aliquot of the stock solution is injected into a 250 ml glass dilution bulb filled with zero air. The bulb is heated in an oven at 40°C for 1 hour. After equilibration, a gas-tight syringe is used to inject 1.8 ppb to 7.2 ppb samples in order to construct a calibration curve. The following data in Table I was obtained:

Table I

Compound	Slope	Correlation Coefficient	R.S.D. at 5.4 ppb (Percent)	M.D.L. (ppb)
Benzene	255	0.9998	1.3	0.5
Toluene	229	0.9996	5.6	1
Ethyl benzene	182	0.9995	2.7	0.5
p-xylene	169	0.9987	1.3	1
m-xylene	185	0.9982	3.5	1
o-xylene	161	0.9563	1.4	1

M.D.L. = Minimum Detectable Limit = Intercept + (3 x R.S.D. x Intercept)

Instrument Conditions

Column	:	10 ft x 2 mm i.d. glass 5% SP1200/1.75% bentone on 100/120 Supelcoport
Injector Temperature	:	200°C
Detector Temperature	:	160°C
Detector Range	:	X1
Detector Attenuation	:	X32
PID Lamp	:	10.2 eV
Valve Temperature	:	180°C
Flow Rate	:	30 ml/minute helium
Oven Temperature Program:		10°C for 1 minute 10°C to 45°C at 8°/minute 45°C to 100°C at 3°/minute

Procedure

Apparatus shown in Figure 1.

1. With the 6-port valve in the "Fill Position" and the 4-port valve closed, the Teflon sampling line is attached to the Tedlar sample bag. The sample line is then flushed for 5 minutes at a flow rate of 20 cc/minute. The isolated Tenax trap is cooled to 30°C during this initial flushing. (Relays 2, 3, 7, 8 off.)

2. When flushing is completed, the 4-port valve is switched to the "Fill Position" and sample is pumped through the trap for 10 minutes at 20 cc/minute. At the beginning of the trapping the internal standard and calibration gas standard are injected through the in-line injector into the gas stream. (Relay 3 on.)

3. At the end of 10 minutes the Tenax trap is isolated (4-port valve closed) and the trap heated to 210°C. The sample inlet is disconnected from the Tedlar sample bag and connected to the auxiliary carrier gas supply to sweep out any residual sample in the lines. (Relay 3 off, then Relay 8 on.)

4. The 6-port valve is switched to the "Sweep Position" allowing the carrier gas to be directed through the 4-port trap valve which is still in the isolated position. (Relay 2 on.)

5. With the GC oven and data system ready the 4-port valve is switched to the "Fill Position" and the data system and the column temperature program are started. (Relays 3, 7 on.)

6. The resulting chromatogram is analyzed and the results quantitated and tabulated. (See Figure 2.)

Automation of this system has been accomplished by use of relay switches/automatically actuated valves and a data system. The following chart details the automation:

Time (Minutes)	Relay On	Relay Off
0.00		2, 3, 7, 8
0.01	3	
10.01		3
10.10	8	
12.00	2	
13.00	3, 7	
23.00		2, 3
24.00		8

Relay 2 = 6-port valve
Relay 3 = 4-port valve
Relay 7 = data system
Relay 8 = Tenax trap heater

Procedure

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24.00		8

Relay 2 = 6-port valve
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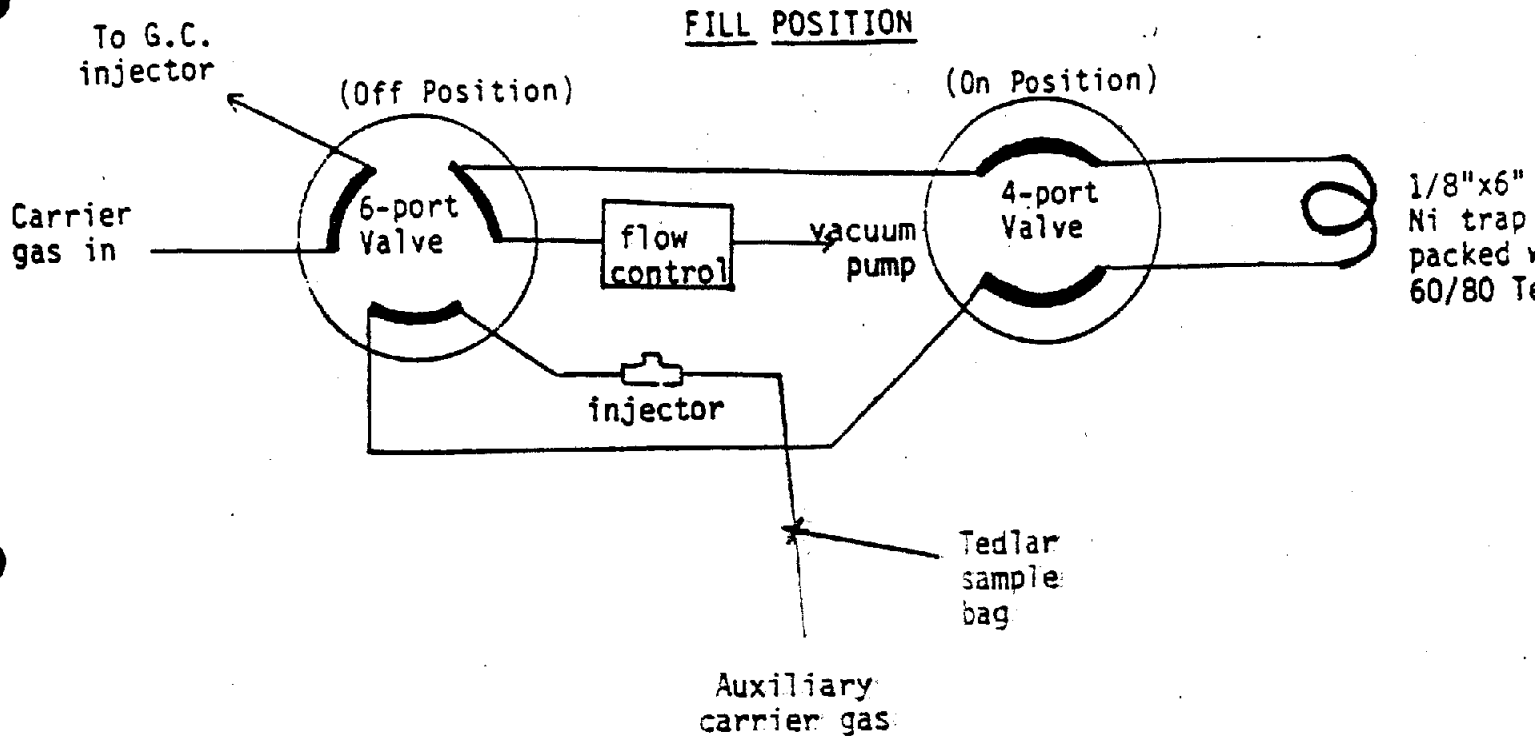
TRAP SYSTEM


FILL POSITION
To G.C. injector
(Off Position)
(On Position)
Carrier gas in
6-port Valve
flow control
vacuum pump
4-port Valve
1/8"x6"
Ni trap
packed
60/80 T
injector
Tedlar sample bag
Auxiliary carrier gas

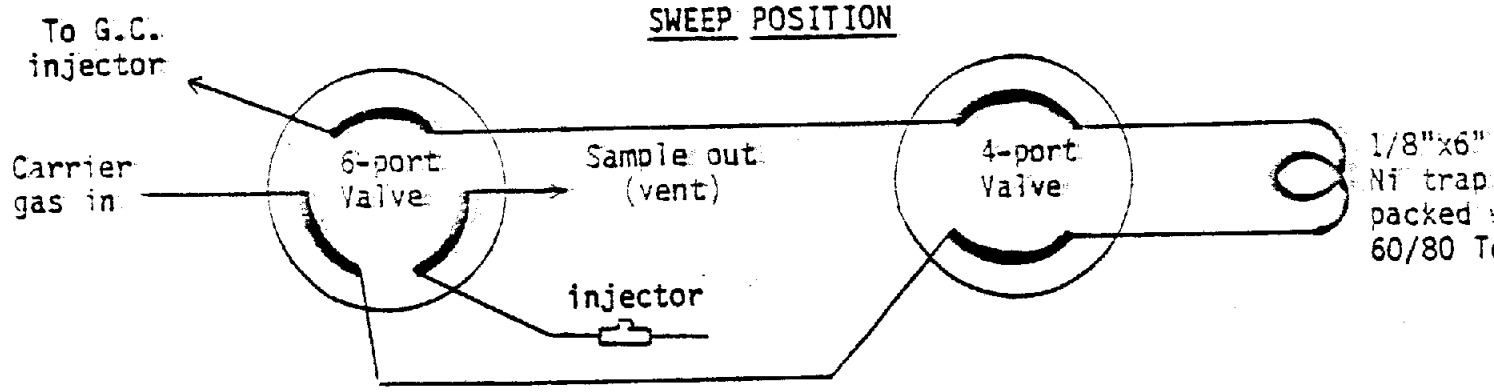
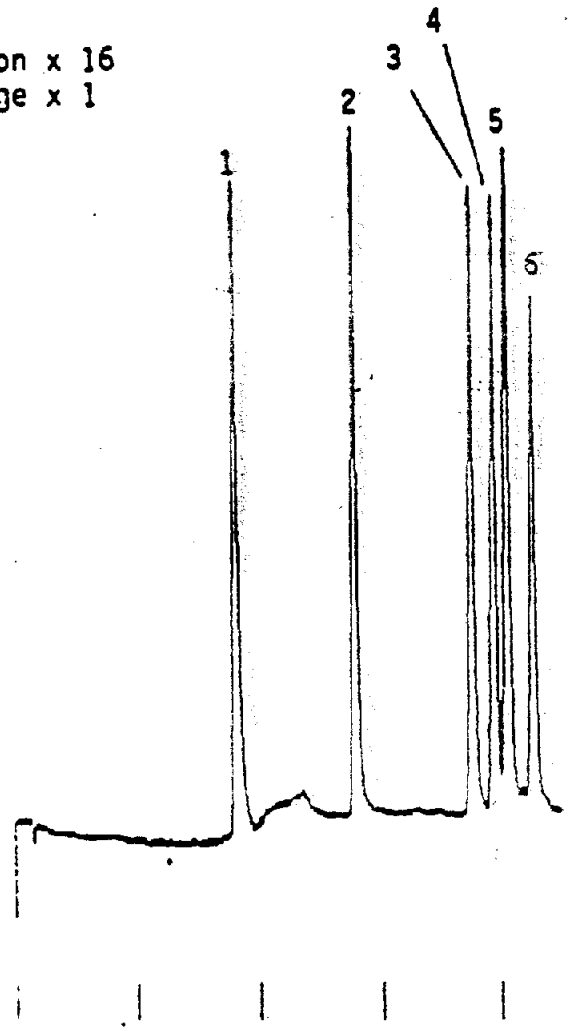

SWEEP POSITION
To G.C. injector
Carrier gas in
6-port Valve
Sample out (vent)
4-port Valve
1/8"x6"
Ni trap
packed
60/80 T
injector

Figure 2

Standard Aromatic Mixture
10ppb/component

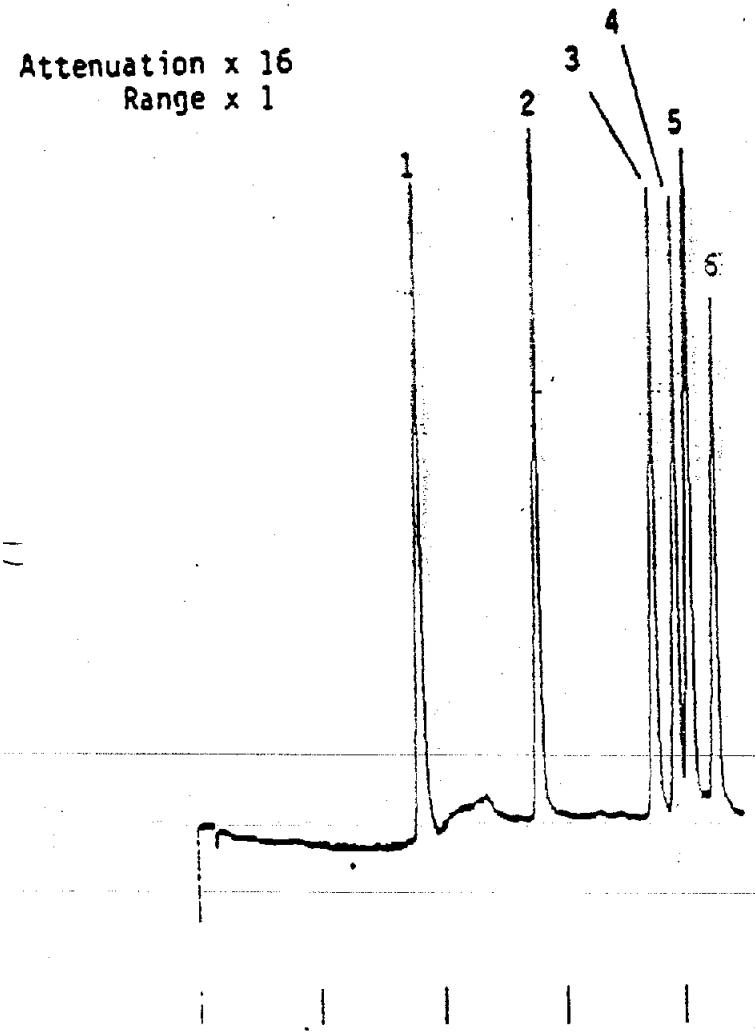
Attenuation x 16
Range x 1



Compound 10 ppb each	Retention Time minutes
1. Benzene	9.114
2. Toluene	13.367
3. Ethyl benzene	18.834
4. p-xylene	19.766
5. m-xylene	20.350
6. o-xylene	21.404

Figure 2

Standard Aromatic Mixture
10ppb/component



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6. o-xylene	21.404

ATTACHMENT 3

SCREENING QUESTIONNAIRE FOR CATEGORY II LANDFILLS

SITE OWNERSHIP

Site name

Site location

Site address

Nearest Cross Streets

Current site owner

Street address

Mailing address

Contact Person **Telephone Number**

Previous site owners

Provide the name and mailing address of all the previous site owners with the most recent owner first. (Attach additional pages if necessary.)

Owner

Mailing Address

Dates

Owner

Mailing Address

Dates

Owner

Mailing Address

Dates

Owner

Mailing Address

Dates

Company performing site maintenance

Mailing address

Contact person Telephone number

SITE HISTORY

Date site started receiving waste:

Percent of site filled by:

January 1, 1960 January 1, 1970

January 1, 1980 Today

Was the waste received by this site ever burned on a routine basis? YES NO

If yes, provide the following:

Date site started burning on a routine basis:

Date site stopped burning on a routine basis:

Has landfill gas migration ever been detected off site? YES NO

If yes, describe the event(s) in detail including date(s). (Attach additional pages if necessary.)

Company performing site maintenance

Mailing address

Contact person Telephone number

SITE HISTORY

Date site started receiving waste:

Percent of site filled by:

January 1, 1960 January 1, 1970

January 1, 1980 Today

Was the waste received by this site ever burned on a routine basis? YES NO

If yes, provide the following:

Date site started burning on a routine basis:

Date site stopped burning on a routine basis:

Has landfill gas migration ever been detected off site? YES NO

If yes, describe the event(s) in detail including date(s). (Attach additional pages if necessary.)

Have landfill gas odors ever been detected off site? YES NO

If yes, describe the event(s) in detail including date(s). (Attach additional sheets if necessary.)

Has any landfill gas, ambient air, or gas migration testing ever been conducted at the site? YES NO

If yes, summarize the testing and the results including date(s). (Attach additional sheets if necessary.)

Has this site ever been subject to any enforcement action by any Federal, state, or local agency as a result of underground gas migration or gaseous emissions to the atmosphere?

YES NO

If yes, summarize the enforcement action(s) and reason(s) including date(s). (Attach additional sheets if necessary.)

SITE DESCRIPTION

Type of fill (Circle appropriate line)

Canyon

Pit

Area (Trench)

Other-Describe

Provide estimate for:

Total Site Acreage

Waste Disposal Area Acreage

Volume of Waste (cubic yards)

Quantity of Waste (tons)

Minimum Depth of Waste (feet)

Maximum Depth of Waste (feet)

Average Depth of Waste (feet)

Average Thickness Of Existing Top Cover (feet)

Does This Site Have A Liner? YES NO

If Yes, Describe:

Type of Cover Material

Provide a map to scale showing the boundaries of the total site and the waste disposal area.

WASTE DESCRIPTION

Estimate of Solid Waste Received (Total of entries for residential, commercial, industrial, demolition, and other should add up to 100%.)

% Residential

% Commercial

% Industrial

% Demolition

% Other

Describe material under "other" and give its percentage.

Material

Percentage

SITE DESCRIPTION

Type of fill (Circle appropriate line)

Canyon

Pit

Area (Trench)

Other-Describe

Provide estimate for:

Total Site Acreage

Waste Disposal Area Acreage

Volume of Waste (cubic yards)

Quantity of Waste (tons)

Minimum Depth of Waste (feet)

Maximum Depth of Waste (feet)

Average Depth of Waste (feet)

Average Thickness Of Existing Top Cover (feet)

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WASTE DESCRIPTION

Estimate of Solid Waste Received (Total of entries for residential, commercial, industrial, demolition, and other should add up to 100%.)

% Residential

% Commercial

% Industrial

% Demolition

% Other

Describe material under "other" and give its percentage.

Material

Percentage

Were liquids ever accepted at this site? YES NO

If yes, describe all liquids received, their corresponding volumes and the disposal methods employed such as injection, evaporation ponds, containers, codisposal, etc. (Attach additional sheets if necessary.)

Liquid	Gallons	Disposal method

Were hazardous wastes in greater than household amounts ever accepted at this site?

YES NO

If yes, describe all hazardous wastes received and the corresponding volumes. (Attach additional sheets if necessary.)

Hazardous Waste	Volume

SURROUNDING LAND USE

Give the distance in miles (to the nearest 0.01 mile) to the nearest:

Occupied building	Describe the Building and Use
Residential Area	School
Hospital	Park
Shopping Center	Business
Public Thoroughfare	

Provide an aerial photograph or topographic map showing the surrounding area within two miles of the solid waste disposal site's perimeter. The photograph or map must identify all land uses in the area and highlight areas of high population such as housing, schools, restaurants, and shopping centers. For areas that are currently undeveloped, the proposed land uses must be shown.

ADDITIONAL INFORMATION

Attach a copy of any waste discharge permits under which the site operated.

Please provide any comments or additional information which you feel will assist in evaluating your site.

Are there any inhabited buildings within 2000 feet of the site perimeter? YES NO

If yes, give the building use, and its distance from the site perimeter:

SURROUNDING LAND USE

Give the distance in miles (to the nearest 0.01 mile) to the nearest:

Occupied building	Describe the Building and Use
Residential Area	School
Hospital	Park
Shopping Center	Business
Public Thoroughfare	

Provide an aerial photograph or topographic map showing the surrounding area within two miles of the solid waste disposal site's perimeter. The photograph or map must identify all land uses in the area and highlight areas of high population such as housing, schools, restaurants, and shopping centers. For areas that are currently undeveloped, the proposed land uses must be shown.

ADDITIONAL INFORMATION

Attach a copy of any waste discharge permits under which the site operated.

Please provide any comments or additional information which you feel will assist in evaluating your site.

Are there any inhabited buildings within 2000 feet of the site perimeter? YES NO

If yes, give the building use, and its distance from the site perimeter:

CHAPTER _____

An act to repeal and add Section 66796.54 of the Government Code, and to repeal and add Section 41805.5 of the Health and Safety Code, relating to solid waste, and declaring the urgency thereof, to take effect immediately.

LEGISLATIVE COUNSEL'S DIGEST

AB 3374, Calderon. Solid waste: disposal sites; air monitoring: water pollution reports.

(1) Existing law requires the State Water Resources Control Board to submit annual reports on or before July 1, 1988, July 1, 1989, and July 1, 1990, on the extent and effect on water quality of hazardous wastes in solid waste disposal sites, with recommendations on needed actions to protect water quality.

This bill would change the dates that the reports are due from the board to January 1, 1989, January 1, 1990, and January 1, 1991, respectively.

(2) Existing law requires solid waste disposal sites to submit a solid waste assessment report to the board of the air pollution control district or the air quality management district by January 1, 1987. The district board is required to examine the report and notify the State Department of Health Services and the California Waste Management Board if the district board determines that hazardous waste is migrating into the air. The State Air Resources Board is required to submit a report to the Legislature on or before July 1 of 1988, 1989, and 1990, concerning hazardous waste in solid waste sites.

This bill would repeal those provisions and would instead require the owner of a solid waste disposal site, as defined, to submit a solid waste air quality assessment test report, as specified, to the district on or before July 1, 1987. The bill would also require the owner of an inactive solid waste disposal site, except as specified, to submit a screening questionnaire to the district on or before November 1, 1986, and to submit specified information

questionnaire by the district. The bill would require the state board to develop guidelines for the test report and evaluation of the screening questionnaire by February 1, 1987, and to develop the screening questionnaire by October 1, 1986.

The bill would authorize a district to exempt a site from these provisions and to reevaluate the status of a solid waste disposal site and require the submission or revision of a test report.

A district would be required to evaluate all test reports for compliance with the state board's guidelines. The bill would require the district to take appropriate remedial action if the district determines, after evaluating the test report and consultation with the department and the California Waste Management Board, that the levels of specified air contaminants, as defined, pose a health risk or a threat to the environment.

The bill would delete the requirement that the state board submit a report to the Legislature by July 1, 1990.

(3) The bill would incorporate additional changes to Section 66796.54 of the Government Code proposed by AB 3088, if this bill and AB 3088 are both enacted and this bill is enacted last.

(4) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement, including the creation of a State Mandates Claims Fund to pay the costs of mandates which do not exceed $50,000 statewide and other procedures for claims whose statewide costs exceed $500,000.

This bill would impose a state-mandated local program by requiring cities, counties, and districts which own a solid waste disposal site or an inactive site to submit a specified test report and by requiring air quality management districts and air pollution control districts to evaluate these reports and take specified actions.

The bill would provide that reimbursement shall be made pursuant to those statutory procedures and, if the statewide cost does not exceed $500,000, shall be payable

certain costs, the bill would provide that no reimbursement is required for a specified reason.

(5) The bill would declare that it is to take effect immediately as an urgency statute.

The people of the State of California do enact as follows:

SECTION 1. Section 66796.54 of the Government Code is repealed.

SEC. 2. Section 66796.54 is added to the Government Code, to read:

66796.54. (a) On or before January 1, 1989, January 1, 1990, and January 1, 1991, the State Water Resources Control Board shall submit a report to the Legislature summarizing the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the quality of waters of the state, and recommending actions needed to protect the quality of water. Each report shall summarize the data from those solid waste water quality assessment test reports which have been submitted on or before January 1 of the preceding year to California regional water quality control boards pursuant to Section 13273 of the Water Code, and shall evaluate the accuracy of the solid waste water quality assessment tests conducted.

(b) On or before July 1, 1988, and July 1, 1989, the State Air Resources Board shall submit a report to the Legislature summarizing the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the ambient air quality of the state, and recommending actions needed to protect the quality of air. The reports submitted on July 1, 1988, and July 1, 1989, shall summarize the data from the solid waste air quality assessment test reports submitted to air quality maintenance districts and air pollution control districts on or before July 1, 1987, and January 1, 1988, respectively, pursuant to Section 41805.5 of the Health and Safety Code, and shall evaluate the accuracy of the solid waste assessment tests conducted.

66796.54. (a) On or before January 1, 1989, January 1, 1990, and January 1, 1991, the State Water Resources Control Board shall submit a report to the Legislature summarizing the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the quality of waters of the state, and recommending actions needed to protect the quality of water. Each report shall summarize the data from those solid waste water quality assessment test reports which have been submitted during the preceding year to California regional water quality control boards pursuant to Section 13273 of the Water Code, and shall evaluate the accuracy of the solid waste water quality assessment tests conducted.

(b) On or before July 1, 1988, and July 1, 1989, the State Air Resources Board shall submit a report to the Legislature summarizing the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the ambient air quality of the state, and recommending actions needed to protect the quality of air. The reports submitted on July 1, 1988, and July 1, 1989, shall summarize the data from the solid waste air quality assessment test reports submitted to air quality maintenance districts and air pollution control districts on or before July 1, 1987, and January 1, 1988, respectively, pursuant to Section 41805.5 of the Health and Safety Code, and shall evaluate the accuracy of the solid waste assessment tests conducted.

SEC. 4. Section 41805.5 of the Health and Safety Code is repealed.

SEC. 5. Section 41805.5 is added to the Health and Safety Code, to read:

41805.5. (a) Except as provided in subdivisions (b) and (c), the owner of a solid waste disposal site shall submit to the district on or before July 1, 1987, a solid waste air quality assessment test report that contains all of the following:

(1) Test results to determine if there is any underground landfill gas migration beyond the solid waste disposal site's perimeter.

certain costs, the bill would provide that no reimbursement is required for a specified reason.

(5) The bill would declare that it is to take effect immediately as an urgency statute.

The people of the State of California do enact as follows:

SECTION 1. Section 66796.54 of the Government Code is repealed.

SEC. 2. Section 66796.54 is added to the Government Code, to read:

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(b) On or before July 1, 1988, and July 1, 1989, the State Air Resources Board shall submit a report to the Legislature summarizing the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the ambient air quality of the state, and recommending actions needed to protect the quality of air. The reports submitted on July 1, 1988, and July 1, 1989, shall summarize the data from the solid waste air quality assessment test reports submitted to air quality maintenance districts and air pollution control districts on or before July 1, 1987, and January 1, 1988, respectively, pursuant to Section 41805.5 of the Health and Safety Code, and shall evaluate the accuracy of the solid waste assessment tests conducted.

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(b) On or before July 1, 1988, and July 1, 1989, the State Air Resources Board shall submit a report to the Legislature summarizing the extent of hazardous waste in solid waste disposal sites and the potential effects these hazardous wastes may have upon the ambient air quality of the state, and recommending actions needed to protect the quality of air. The reports submitted on July 1, 1988, and July 1, 1989, shall summarize the data from the solid waste air quality assessment test reports submitted to air quality maintenance districts and air pollution control districts on or before July 1, 1987, and January 1, 1988, respectively, pursuant to Section 41805.5 of the Health and Safety Code, and shall evaluate the accuracy of the solid waste assessment tests conducted.

SEC. 4. Section 41805.5 of the Health and Safety Code is repealed.

SEC. 5. Section 41805.5 is added to the Health and Safety Code, to read:

41805.5. (a) Except as provided in subdivisions (b) and (c), the owner of a solid waste disposal site shall submit to the district on or before July 1, 1987, a solid waste air quality assessment test report that contains all of the following:

(1) Test results to determine if there is any underground landfill gas migration beyond the solid waste disposal site's perimeter.

ambient air adjacent to the solid waste disposal site to determine the effect of the site on air quality.

(3) Chemical characterization test results to determine the composition of gas streams immediately above the solid waste disposal site, or immediately above the solid waste disposal site and within the solid waste disposal site, as appropriate, as determined by the district.

(4) Any other information which the district board may require, by emergency regulation.

The solid waste air quality assessment test report shall be prepared in accordance with the guidelines developed by the state board pursuant to subdivision (d).

(b) The owner of an inactive solid waste disposal site shall complete and submit the screening questionnaire, developed pursuant to subdivision (e), to the district on or before November 1, 1986, unless the owner is required to submit a report containing the same information specified in subdivision (a) pursuant to a federal, state, or district order, or unless exempted pursuant to subdivision (c). The district shall evaluate the submitted screening questionnaires in accordance with the guidelines developed pursuant to subdivision (e) and shall determine whether the owner of the site be required to submit all, or a portion of, the information required to be reported in a solid waste air quality assessment test report. The district shall notify the owner in writing on or before January 1, 1987, of the information identified in subdivision (a) to be submitted for the site. After receiving this notification, the owner of the inactive solid waste disposal site shall submit a solid waste air quality assessment test report containing the required information on or before January 1, 1988, to the district.

(c) A district may exempt from subdivisions (a) and (b) a solid waste disposal site or inactive solid waste disposal site which has accepted or now contains only inert and nondecomposable solids. To receive an exemption, the owner of the site shall submit, on or before November 1, 1986, a copy of all permits, all waste discharge requirements pertinent to the site, and any

whether an exemption should be granted to the site.

(d) On or before February 1, 1987, the state board, in coordination with the districts, shall develop and publish test guidelines for the solid waste air quality assessment report specifying the air contaminants to be tested for and identifying acceptable testing, analytical, and reporting methods to be employed in completing the report.

(e) On or before October 1, 1986, the state board, in coordination with the districts, shall develop and publish a screening questionnaire for inactive solid waste disposal sites and guidelines for evaluating the questionnaire by the districts pursuant to subdivision (b). The screening questionnaire and guidelines shall require an inactive solid waste disposal site to be evaluated based on the nature and age of materials in the site, the quantity of materials in the site, the size of the site, and other appropriate factors. The guidelines for evaluating the screening questionnaire shall require a district to weigh heavily the proximity of the site to residences, schools, and other sensitive areas, and to pay particular attention to potential adverse impacts on facilities such as hospitals and schools, and on residential areas, within one mile of the site's perimeter.

(f) A district may reevaluate the status of a solid waste disposal site, including sites exempted pursuant to subdivision (c), and require the owner to submit or revise a solid waste air quality assessment test report after January 1, 1987. The district shall give written notification to the owner of the solid waste disposal site that a solid waste air quality assessment test report is to be submitted, or that the existing report is to be revised, and the date by which the report is to be submitted.

(g) A district shall evaluate any solid waste air quality assessment test reports submitted pursuant to subdivisions (a), (b), and (f), and determine if the report's testing, analytical and reporting methods comply with the guidelines developed pursuant to subdivision (d). If the district determines that the solid waste air quality assessment test report complies with the guidelines, it shall evaluate the data. If the district

determines, after evaluation of the report and consultation with the state department and the California Waste Management Board, that levels of one or more specified air contaminants pose a health risk to human beings or a threat to the environment, the district shall take appropriate remedial action.

(h) If a district determines that a solid waste air quality assessment test report does not comply with the guidelines developed pursuant to subdivision (d), the district shall provide the owner of the site with a written notice specifying the inadequacies of the report and shall require the owner to correct the deficiencies and resubmit the report by a date determined by the district.

(i) For the purpose of this section, the following definitions apply:

(1) "Inactive solid waste disposal site" means a solid waste disposal site which has not received any solid waste for disposal after January 1, 1984.

(2) "Landfill gas" means any untreated, raw gas derived through a natural process from the decomposition of organic waste deposited in a solid waste disposal site or from the evolution of volatile species in the waste.

(3) "Perimeter" means the outer boundary of the entire solid waste disposal site property.

(4) "Solid waste disposal site" means a place, location, tract of land, area, or premises in use, or which has been used, for the landfill disposal of solid waste, as defined in Section 66719 of the Government Code, or hazardous waste, as defined in Section 66714.8 of the Government Code, or both.

(5) "Specified air contaminants" means substances determined to be air contaminants by the state board in coordination with the districts. The state board and the districts shall consider determining the following compounds to be air contaminants for purposes of this paragraph: benzene, chloroethene, 1,2-dibromoethane, 1,2-dichloroethane benzyl chloride, chlorobenzene, dichlorobenzene, 1,1-dichloroethene, dichloromethane, formaldehyde, hydrogen sulfide, tetrachloroethylene,

trichloroethylene, trichloromethane, xylene, and any other substance deemed appropriate by the state board or a district.

SEC. 6. Section 3 of this bill incorporates changes to Section 66796.54 of the Government Code proposed by both this bill and AB 3088. It shall only become operative if (1) both bills are enacted and become effective on or before January 1, 1987, but this bill becomes operative first, (2) this bill repeals and adds Section 66796.54 of the Government Code and AB 3088 amends Section 66796.54 of the Government Code, and (3) this bill is enacted after AB 3088, in which case Section 66796.54 of the Government Code, as added by Section 2 of this bill, shall remain operative only until the operative date of AB 3088, at which time Section 3 of this bill shall become operative.

SEC. 7. Reimbursement to local agencies and school districts for costs mandated by the state pursuant to this act shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code and, if the statewide cost of the claim for reimbursement does not exceed five hundred thousand dollars ($500,000), shall be made from the State Mandates Claims Fund, except that no reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution for the cost of the program or level of service mandated by this act that the local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay that cost.

SEC. 8. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

In order to fully and fairly implement the provisions of Chapter 1532 of the Statutes of 1984 relating to disposal of hazardous waste, and to implement the reporting requirements of this act, as quickly as possible, it is necessary that this act take effect immediately.

determines, after evaluation of the report and consultation with the state department and the California Waste Management Board, that levels of one or more specified air contaminants pose a health risk to human beings or a threat to the environment, the district shall take appropriate remedial action.

(h) If a district determines that a solid waste air quality assessment test report does not comply with the guidelines developed pursuant to subdivision (d), the district shall provide the owner of the site with a written notice specifying the inadequacies of the report and shall require the owner to correct the deficiencies and resubmit the report by a date determined by the district.

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(1) "Inactive solid waste disposal site" means a solid waste disposal site which has not received any solid waste for disposal after January 1, 1984.

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(3) "Perimeter" means the outer boundary of the entire solid waste disposal site property.

(4) "Solid waste disposal site" means a place, location, tract of land, area, or premises in use, or which has been used, for the landfill disposal of solid waste, as defined in Section 66719 of the Government Code, or hazardous waste, as defined in Section 66714.8 of the Government Code, or both.

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trichloroethylene, trichloromethane, xylene, and any other substance deemed appropriate by the state board or a district.

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In order to fully and fairly implement the provisions of Chapter 1532 of the Statutes of 1984 relating to disposal of hazardous waste, and to implement the reporting requirements of this act, as quickly as possible, it is that this act take effect immediately.

Landfill Gas Report to APCO

Summary of Test Results (See attached Disposal site Report)

Disposal site description
- Gas collection system
- Area map
- Surrounding land use
  - Current
  - Proposed

Monitoring System
- Disposal site map
- Well locations
- Probe descriptions
- Equipment descriptions
- Analysis methods

Results
- Ambient air
- Gas characterization
- Off site migration
- Quality Assurance
- Photographs

Remedial Action
- Ordered
- Results

DISPOSAL SITE REPORT

Disposal site Name:

Location (Latitude and Longitude or UTM coordinates):

POPULATION	Within 1 mile	1 to 2 miles	2 to 3 miles

		AMBIENT AIR SAMPLING Concentrations, ppb				
		UPWIND		DOWNWIND		BACKGROUND
		Site 1	Site 2	Site 1	Site 2	Background
COMPOUND	Laboratory Detection Limits, ppb					
Vinyl Chloride						
Benzene						
Ethylene Dibromide						
Ethylene Dichloride						
Methylene Chloride						
Perchloroethylene						
Carbon Tetrachloride						
Methyl Chloroform						
Trichloroethylene						
Chloroform						
Methane						

CHAIN OF CUSTODY RECORD

REPORTING AGENCY: _____

STATION ADDRESS: _____

STATION NAME: _____

STATION OPERATOR:* _____

Relinquished By:*	Received By:*	Date/Time
Relinquished By:*	Received By:*	Date/Time
Received for Laboratory By:*		Date/Time

Method of Shipment: _____

TO BE COMPLETED BY LABORATORY

SAMPLE NO.	LABORATORY NO.

DISPOSITION:

IMMEDIATE ANALYSIS ☐ STORAGE ☐ REFRIGERATOR ☐ ID _____ SECURED YES ☐
FREEZER ☐ ID _____ NO ☐

* Print name after signature.

Air Resources Board
Laboratory Services Section
1309 T Street
Sacramento, CA 95814