

Barry Wallerstein

07-5-6

May 24-25, 2007



South Coast Air Quality Management District

21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov



*Office of the Executive Officer
Barry R. Wallerstein, D.Env.
909.396.2100, fax 909.396.3340*

May 23, 2007

Ms. Catherine Witherspoon
Executive Officer
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Dear Ms. Witherspoon:

Comments on the California Air Resources Board Proposed Regulation for In-Use Off-road Diesel Vehicles

The South Coast Air Quality Management District (AQMD) staff appreciates the opportunity to provide comments on the proposed regulation for in-use off-road diesel vehicles. Although we commend the California Air Resources Board (CARB) staff's efforts in developing this proposal, we believe that the proposed regulation does not adequately address NOx reductions for the South Coast Air Basin and we urge you to consider enhancements to the proposed regulation to maximize NOx reductions, which are critically needed for the Basin to meet the PM2.5 and 8-hour ozone standards.

As you are well aware, the AQMD staff is currently in the final stages of developing its 2007 Air Quality Management Plan (AQMP) with a primary focus on demonstrating attainment of the federal PM2.5 ambient air quality standard by 2015 and the federal 8-hour ozone standard by 2024. Achieving these standards represents a tremendous challenge to this region because of the magnitude of additional emission reductions required. Both of our agencies acknowledge that significant NOx reductions from mobile sources would be required for meeting these health-based air quality standards. Without adequate emission reductions from major mobile source categories including the off-road diesel equipment, attainment of the federal air quality standards will be seriously jeopardized.

This letter provides: 1) an evaluation of CARB's proposed regulation for in-use off-road diesel vehicles, 2) rationale for AQMD staff's proposed enhancements to the proposed regulation for achieving additional NOx reductions, and 3) a summary of AQMD staff's proposed enhancements to the proposed regulation. Attachment 1 of this letter includes AQMD staff's more detailed revisions to the proposed rule language.

Evaluation of CARB's Proposed Regulation

Under the proposed regulation, fleet operators are required to meet PM and NOx fleet average target requirements which decline over time. PM targets are established for large, medium, and small size fleets while NOx targets only apply to large and medium fleets. Alternatively, fleet operators could demonstrate compliance with the proposed regulation by meeting BACT based on turnover (repower or replacement) or retrofit requirements. Specifically, operators would be required to turnover 8% of their fleet per year (up to 2015 and 10% after 2015) for NOx and retrofit 20% of their fleet per year to comply with PM requirements. The following key points are provided based on AQMD staff's evaluation of the proposed rule:

1. Off-road diesel equipment covered under the proposed regulation represent the second largest source of NOx emissions in the Basin in 2014; the year by which full reductions for PM2.5 attainment must be achieved. In the Draft 2007 Air Quality Management Plan (AQMP), this source category contributes to 96 tons per day (tpd) of NOx emissions in the Basin (i.e., 15% of overall emissions) and is preceded only by on-road heavy-duty vehicles (134 tpd). The remaining major mobile source categories include ships (86 tpd), passenger cars and light-duty trucks (77 tpd), trains (23 tpd), and aircraft (22 tpd). Based on the attainment demonstration in the draft 2007 AQMP, 29% (or 192 tons per day) and 76% (or 383 tons per day) of additional NOx reductions are required in 2014 and 2023 for meeting the PM2.5 and the 8-hour ozone standards, respectively. Therefore, because of the significant contribution of the off-road diesel vehicles category and the level of overall reductions needed for attainment, reductions from this important source category are absolutely critical for meeting both air quality standards.
2. The proposed regulation does not adequately address NOx emissions and the associated health impacts. The proposed rule would only achieve 11% and 30% NOx reductions in 2014 and 2023, respectively, compared to 53% and 72% PM2.5 reductions in 2014 and 2023, respectively. While the proposed PM requirements would yield substantial health benefits, the proposed rule falls short of establishing equally stringent NOx requirements to maximize the overall public health benefits. As indicated in CARB's technical support document (Table IV-4), there are significant health impacts associated with both directly-emitted diesel PM as well as indirect diesel PM (nitrates formed from NOx) ranging from premature mortality to hospital admissions, respiratory symptoms, acute bronchitis, and lost work days.

3. The current proposed regulation is less stringent than the first draft released earlier this year resulting in foregone reductions of 3.5 tons per day of NOx in the Basin in 2014. Under the current proposal, the implementation dates have been moved back and turnover requirements have been reduced from 10% to 8% from 2010 to 2015. The draft 2007 AQMP identifies NOx emission reduction shortfalls for PM2.5 attainment in 2015 (after implementation of the short-term control measures proposed by CARB and AQMD) of which 3.5 tons per day is attributable to the foregone reductions of the current proposed regulation. The reduction gap could however be alleviated primarily with additional NOx controls from mobile sources in combination with local controls on PM sources. Additional NOx reductions from this source category could be achieved through greater turnover in the early years to cleaner equipment/vehicles or through compliance with more stringent fleet average NOx targets. Given the magnitude of the reductions needed for PM2.5 attainment, the proposed regulation needs to be strengthened to achieve greater levels of NOx reductions.
4. Because of the proposed NOx fleet average targets and the corresponding turnover rate requirements, substantial number of uncontrolled Tier 0 equipment and modestly controlled Tier 1 equipment would still remain in use in 2015. By 2015, Tier 0 engines will be at least 16-to-20 years old (with some engines over 30 to 40 years old) without any controls and Tier 1 engines will be between 10-to-19 years old with only minimal controls. AQMD staff believes that the clean-up of existing Tiers 0 and 1 equipment should be a high priority and should be greatly expedited similar to any other “gross” polluting engine or vehicle. The proposed rule could be designed in such a manner that would accelerate the replacement of existing Tier 0 and 1 equipment while providing flexibility to the fleet operators to choose the best compliance option.

Rationale for the AQMD Staff’s Enhancement of the Proposed Regulation

Based on the assessment of the proposed regulation, AQMD staff believes that additional NOx reductions from this source category are both technically and economically feasible. The proposed regulation could be enhanced based on more stringent NOx fleet targets and turnover requirements. However, in order to minimize any potential economic impacts, AQMD staff believes that the focus of these additional requirements should be on large fleets (i.e., with greater than 5,000 total maximum horsepower as defined in the proposed regulation) who have over 40% Tier 0 and 1 equipment in their fleets. The rationale for AQMD staff’s proposal is as follows:

1. Based on CARB’s 2005 off-road equipment survey, large fleets represent only 13% of the overall number of fleets yet account for 80 to 90% of the total maximum horsepower. Under the AQMD staff’s proposal, small fleets with a total maximum power of 1,500 hp representing 71% of the total fleet and the medium fleets representing the remaining 16% of the total fleet would not be subject to any

additional requirements beyond CARB's proposed regulation. Therefore, any potential economic impacts associated with the additional requirements proposed by AQMD staff will be limited to only large fleets (and only to those that have over 40% Tier 0 and 1 equipment in their existing fleet).

2. As acknowledged in CARB's staff report, because of their economies of scale, greater resources and revenue streams and greater access for financing, large fleets are more likely to be able to absorb or pass on the implementation cost of the proposed regulation without any significant impact on their profitability. Based on the same reasoning, AQMD staff also believes that large fleets can also bear or pass on the cost of the additional requirements.
3. Increasing the turnover rate requirements and accelerating the NOx fleet average targets (i.e., for equipment greater than 175 hp) beyond the proposed regulation will result in substantial turnover of additional Tier 0 and 1 equipment which would otherwise remain operational for many years under CARB's proposed regulation. With an accelerated turnover, additional NOx reductions from this source category will be achieved in the early years.
4. Beginning 2006, Tier 3 off-road diesel equipment has become commercially available for a majority of engine size categories (i.e., 100 to 750 hp) and will be available for smaller engines (50 to 100 hp) next year. Therefore, opportunities already exist today to modernize the existing Tier 0 and 1 equipment with cleaner Tier 3 equipment (or engines). Replacement (or repower) of uncontrolled "gross" polluting Tier 0 equipment with Tier 3 equipment will result in 70 to 80% reduction in NOx and PM emissions while replacement (or repower) of Tier 1 equipment with Tier 3 equipment will provide about 50% reduction in both pollutants.
5. NOx after-treatment control devices are also rapidly becoming available offering lower compliance costs compared to equipment or engine replacement. Retrofit control devices capable of achieving about 40% NOx reduction will be available this year (e.g., Johnson/Matthey EGRT, which includes integrated diesel particulate filter system). In addition, several retrofit manufacturers are in the process of or will be verifying SCR type retrofit kits with over 80% NOx reduction efficiency in the next couple of years with commercial availability expected within the next two to three years.

Summary of AQMD staff's Proposed Enhancements to the Proposed Regulation

The proposed revisions will further enhance the effectiveness of the proposed regulation in reducing the overall health impacts of in-use off-road diesel equipment. These revisions are proposed to apply to large fleets with over 40% Tier 0 and 1 equipment in their fleet. The higher turnover rate requirements and more stringent NOx fleet targets are proposed concurrently to ensure that the required NOx reductions are achieved following

either compliance path. Annually, fleet operators would have the option of meeting the NOx fleet targets or turning over their equipment at the prescribed rate. The following summarize the major revisions proposed by AQMD staff:

1. For large fleets with over 40% Tier 0 and 1 equipment, accelerate the NOx fleet average target by four years beginning in 2014 for engine size categories over 175 hp (compared to the current CARB staff proposed regulation). These larger engines are generally older and higher polluting (per engine due to larger engine size and higher operating hours) and are replaced less often compared to smaller engines. Therefore, these engines are weighted more heavily in calculation of the fleet's NOx index and target rates. Each year, fleet operators will have the option of meeting the fleet NOx target rates or the BACT requirements described in the next section.
2. For large fleets with over 40% Tier 0 and 1 equipment, increase the annual turnover rate requirement from 8% to 15% for 2010 to 2015 (and keep the turnover rate to 10% after 2015). At 8% turnover rate, a fleet composed of primarily Tier 0 and 1 equipment will, at most, replace or repower only up to 40% of its fleet in five years by 2014. However, with the higher 15% turnover rate, a substantial number of additional Tier 0 and 1 equipment (i.e., about 90%) will be replaced with cleaner engines by 2014. The equipment should be turned over or repowered/retrofitted to meet Tier 3 or cleaner emission standards.
3. New purchases or repowers must meet Tier 3 or higher NOx emission levels. Tier 2 repowers or purchases should only be allowed if retrofitted to at least Tier 3 NOx emission levels. This provision will limit the introduction of Tier 2 or older equipment into the fleet upon rule adoption.
4. In addition to the above key proposals, a number of specific revisions are also recommended to further improve the effectiveness of the proposed rule. The proposed revisions to the rule language including the AQMD staff's proposed enhancements are provided in Attachment 1 of this letter.

When the AQMD staff made its proposal to CARB, CARB staff conducted an analysis of the AQMD staff proposal and found that the AQMD staff proposal would achieve an additional 13 tons per day of NOx emission reductions in 2014 in the South Coast Air Basin and an additional 7.6 tons per day in 2020. However, there was a slight loss of PM emission reductions under the AQMD staff proposal compared to the current proposed regulation. Since that time, AQMD staff acquired the computer model that CARB has been using for the regulatory analysis and has continued to conduct analysis of the current proposed regulation and the AQMD staff proposal. We have refined our original proposal specifically for the stringency of the NOx fleet average targets to the proposal presented here. The current proposal shows that the AQMD staff proposal will have equivalent PM

reductions as the CARB staff proposed regulation. The NOx reductions estimated for the AQMD staff proposal will still be about twice that of the CARB staff proposed regulations.

The estimated cost to comply with the proposed revisions in the South Coast Air Basin is about \$400 million (above the cost of CARB's proposed regulation) over a 16 year period (2009 to 2025). As indicated earlier, large fleets are expected to withstand the additional compliance cost by either absorbing the cost or passing on the cost to their customers. It should be noted that with the anticipated availability of retrofit control devices, the cost of compliance with the proposed requirements are expected to be substantially lower.

Availability of Clean Engines and Retrofits

Concerns have been raised relative to the commercial availability of new equipment and verified diesel emission control systems needed to comply with the proposed regulation. It is even more critical to have cleaner equipment and retrofit technologies as early as possible with the AQMD staff proposal. Based on the AQMD staff's assessment, Tier 3 engines are being sold today and by 2010, a significant majority of the off-road engines will be Tier 3 engines. We strongly believe that for equipment with engines less than 250 hp, the more likely scenario will be replacement to a new piece of equipment. It is our understanding that the current CARB staff proposal would increase the demand for new equipment in California by less than 3 percent of the national sales. The AQMD staff proposal would be about twice this number. As such, we believe that there will be commercially available products in the 2010 to 2014 timeframe. In addition, the current proposed regulation contains a special provision in the event a fleet operator cannot comply with the rule due to equipment manufacturer delays.

We also recognize that some fraction of the replacement would be to purchase pre-owned equipment. We strongly believe that if an operator purchases a pre-owned piece of equipment that it would most likely be a Tier 1 or Tier 2 piece of equipment. As such, the AQMD staff recommends that language be provided to have the fleet operator purchase the cleanest available equipment and demonstrate why the cleanest available could not be purchased, to provide some compliance flexibility. We also recommend that if it is a Tier 2 vehicle that the vehicle be retrofitted to Tier 3 to provide additional NOx reductions. Johnson-Matthey is in the process of verifying an exhaust gas recirculation (EGR) device that would bring a Tier 2 engine to the Tier 3 level. This "EGRT" device will be verified by mid-2008.

Relative to equipment with greater than 175 hp, the AQMD staff believes that many of this equipment will be repowered or retrofitted. We estimate that the number of pieces of equipment with greater than 175 hp make up about 25 percent of the remaining Tier 0 and 1 equipment (about 5,800 in the South Coast Air Basin) after implementation of the current CARB proposed regulation. A majority of this equipment with greater than 250 hp have undergone repowers under the Carl Moyer Program. We believe that most of

this equipment will undergo repowers to comply with the proposed regulation and a smaller number will be retrofitted. As such, we believe that there will be sufficient engines or retrofit devices in the 2011 to 2014 timeframe for this horsepower category to comply with the AQMD staff proposal.

As you are aware, the South Coast AQMD is working with your staff and the Mobile Source Emission Reduction Review Committee (MSRC) to conduct a "Showcase" program of off-road retrofit technologies to expedite the introduction of these technologies. It is our understanding that the program will be oversubscribed and the proposal close date is still a month from now. The AQMD staff will evaluate all of the proposals with your staff and the MSRC. If the program is oversubscribed, the AQMD staff will determine if additional funding could be provided to demonstrate additional technologies. If additional funding is necessary, we will bring a request to the AQMD Governing Board to consider the additional funding.

Relative to the state-of-technology on selective catalytic reduction (SCR) retrofit technologies, the AQMD conducted a one-day technical roundtable discussion on May 1, 2007. One of the most encouraging outcomes of the roundtable is that the five manufacturers who participated indicated that they can bring SCR retrofit devices to the market in the 2009 timeframe. Many of the devices will be integrated with particulate control devices (with the preferred Level 3 technology). We believe that such activities by the manufacturers and the Showcase program will address the concerns raised.

Health Impacts and Costs

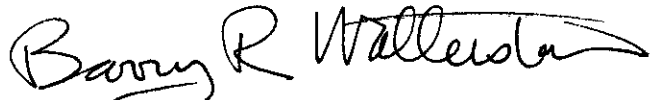
Clearly, the health impacts of the off-road diesel equipment are enormous and efforts must be made now to minimize these impacts by maximizing the emission reductions from the proposed regulation. As indicated through the AQMD staff's analysis and confirmed by CARB's staff analysis of the AQMD staff proposal, additional NOx reductions are technically feasible. We recognize the potential financial impacts that a more aggressive regulation would bring. As such, we strongly recommend that public funding such as the Carl Moyer Program be made available on a targeted basis to affected fleets to assist in implementation of the proposed regulation. Such practice is being implemented for agricultural sources, and we believe this can be extended to the affected industries subject to the proposed regulation in those instances where necessary. In addition, consideration should be given to establishing a low interest loan program, possibly with CARB's portion of the Proposition 1B funds. Regardless, the AQMD staff is committed to pursuing higher levels of financial incentives for affected fleet operators.

In addition, we suggest consideration of a special provision be included for those large fleets affected by the AQMD staff proposal that demonstrate a financial hardship and cannot access financial assistance to comply with the AQMD staff proposal to instead comply with the CARB staff proposed regulation. The Staff Report indicated that "a 10 percent decline in "return on owner's equity" has traditionally been used by ARB to indi-

cate a significant impact on profitability.” We believe that this criterion could be a starting point for discussion concerning an economic hardship provision.

We strongly urge CARB to consider AQMD staff’s recommended enhancements to the proposed regulation. We are committed to working with your staff to further refine these revisions and develop a revised regulation. Although these requirements could be applicable on a statewide basis, we ask that you consider our proposal to apply at a minimum, to PM_{2.5} nonattainment areas with provisions to address equipment operating across the state. We also welcome alternatives to the AQMD staff’s proposal if the alternative proposals achieve additional emission reductions similar to the AQMD staff proposal. If you have questions about the AQMD staff’s proposed revisions, please call me at (909) 396-2100.

Sincerely,

A handwritten signature in black ink that reads "Barry R Wallerstein". The signature is fluid and cursive, with the first name "Barry" being the most prominent.

Barry R. Wallerstein, D.Env.
Executive Officer

CSL:HH:ZP

Attachment

Attachment 1
AQMD Staff's Proposed Revisions to Rule Language

The following revisions are proposed to the rule language released on April 6, 2007 to achieve additional NOx emission reductions:

- 1) Section 2449(d)(1)(A)1 – NOx Fleet Average Requirements - Revise Table 1 of the proposed rule to apply only to medium fleet. Add the following new table of NOx targets for large fleets with over 40% Tier 0 and 1 equipment.

NOx Targets for each Max Hp Group								
Compliance Date: March 1 of Year	25-49 hp	50-74 hp	75-99 hp	100-174 hp	175-299 hp	300-599 hp	600-750 hp	>750 hp
2010	5.8	6.5	7.1	6.4	6.2	5.9	6.1	7.2
2011	5.6	6.2	6.7	6.0	5.85.4	5.55.1	5.65.3	6.86.4
2012	5.3	5.8	6.2	5.5	5.34.5	5.14.3	5.24.4	6.55.7
2013	5.1	5.5	5.7	5.1	4.93.7	4.73.5	4.83.6	6.14.9
2014	4.9	5.1	5.2	4.7	4.52.8	4.32.7	4.42.7	5.74.1
2015	4.6	4.8	4.8	4.3	4.12.3	3.92.3	4.02.3	5.33.8
2016	4.4	4.4	4.3	3.8	3.61.9	3.51.9	3.61.9	4.93.4
2017	4.2	4.1	3.8	3.4	3.21.5	3.11.5	3.21.5	4.53.2
2018	4.0	3.7	3.3	3.0	2.81.2	2.71.2	2.71.2	4.13.0
2019	3.7	3.4	2.8	2.6	2.31.0	2.31.0	2.31.0	3.82.8
2020	3.5	3.2	2.4	2.2	1.90.9	1.90.9	1.90.9	3.42.6

- 2) Section 2449(d)(2)(A) – Turnover Requirements for Fleets Not Meeting NOx Target Rate – Revise this section for large fleets (>5000 hp as defined in the proposed rule) with over 40% Tier 0 and 1 equipment in their fleet as follows:
 - a. Increase Turnover Rate to 15% from 8%. [2449(d)(2)(A)(1)]
 - b. Require repowering with new engines to be Tier 3 (instead of Tier 2) or higher [2449(d)(2)(A)]
 - c. Allow credits for repowers to Tier 2 (instead of Tier 1) or higher engines before 2007 (instead of 2009). After 2007, only allow credits for repowers to Tier 3. [2449(d)(2)(A)(2)(a)(i)]
 - d. If the large fleet does not meet the PM average provisions of Section 2449(d)(1)(A)2., then the repowered, retrofit, or replacement vehicle under this provision shall be retrofitted with a PM control device as provided in Section 2449(d)(2)(B)1.
 - e. Apply carryover turnover credits to more than 15% turnovers (instead of from 8%) between 2010 and 2015. [2449(d)(2)(A)(2)(b)(i)]

- f. Revise exemption for vehicles retrofitted with PM controls to 4 years (instead of 6 years). [2449(d)(2)(A)(4)(c)]
- g. Delete section on delaying Tier 1 turnover to 2013. [2449(d)(2)(A)(5)]

3) Section 2449(d)(7) – Adding Vehicles – Revise this section as follows:

- a. Disallow the addition of any Tier 0 equipment to fleet immediately upon rule adoption. Any Tier 0 equipment added after rule adoption shall be subject to immediate and mandatory phase-out and should not be counted toward fleet's index or target rates or turnover requirements.
[2449(d)(7)(A)]
- b. Require newly added equipment to be either Tier 3 or Tier 4, or Tier 2 retrofitted with NOx control device with a minimum of 40% reduction efficiency (which will be equivalent to Tier 3 equipment). This requirement should apply whether or not the fleet meets the target rates.
[2449(d)(7)(B)(1) and (2)] and [2449(d)(7)(C)]

Additional Recommended Rule Language Revisions

The following revisions are proposed to the rule language released on April 6, 2007 to strengthen the current proposed regulation:

- 1) Section 2449(d)(1)(C) – Electric and Alternative Fuel Vehicles and Systems Used to Replace Diesel Vehicles – Delete credits for electric ground support equipment (GSE) to avoid any possible overlaps with existing and future regulations. Credits for GSE electrified prior to or after 2007 are already taken into account in the previous MOU with the airlines and/or included in CARB’s large spark-ignited (LSI) regulation. Also, as indicated in CARB’s latest SIP state strategy, there are additional opportunities for GSE electrification (beyond CARB’s existing LSI regulation) which should be investigated for future controls, and therefore, any electric GSE after 2007 should not be double credited under the off-road diesel equipment regulation.
- 2) Section 2449(d)(1)(D) – Hours in Fleet Average Option – In order to prevent any possible manipulation of this section, the hours of operation should be considered in calculating both the NOx and PM target rates as well as the NOx and PM index. The inclusion of operating hours to calculate the target and index rates would provide a better correlation between target/index rates and the actual emissions and should be considered as a requirement for large fleets.
- 3) Section 2449(e)(6) – Compliance Extension for Equipment Manufacturer Delays – This section provides an open-ended extension where the operation or installation of new equipment or vehicles could be extended indefinitely due to manufacturer delays. We strongly recommend that this section be revised to only allow a maximum of 30 days delay in operating or installing the new equipment or vehicles due to manufacturer delays. In signing contractual agreements with the manufacturers, the manufacturer should be held liable for any delays longer than 30 days. Under such circumstances, the manufacturers will be required to provide alternative equipment or vehicles capable of achieving the equivalent reductions.
- 4) Section 2449(e)(9) – Compliance Flexibility for Delays in Availability of Tier 4 Vehicles – This section allows the Executive Officer to grant extension to the fleet in meeting their requirements for any delays in the availability of Tier 4 equipment. We strongly recommend that this section be revised to establish additional criteria before any such extension can be granted. Such criteria should at minimum include a demonstration by the operator that: 1) Equipment meeting Tier 4 emissions levels are absolutely necessary to meet the turnover and target requirements for a given year; and 2) retrofit control devices capable of achieving equivalent reductions are not available.