

Appendix F

Ambient Air Quality Standard Protection Discussion

Threshold of Emission Significance

ARB staff developed the proposed large project review provision in conjunction with the local districts that would be affected by this provision. The provision is applicable only to the districts that have a nonattainment status of extreme for ozone. As of this report, the only districts with this status are San Joaquin Valley APCD and South Coast AQMD.

To determine the appropriate threshold that would trigger the notification requirement in this provision, we reviewed the Air Quality Significance Thresholds (AQST) of each district. For South Coast AQMD, the AQST for NO_x emissions is 100 lb/day for construction, and 55 lb/day for other operations. The AQST for NO_x in San Joaquin Valley APCD is 55 lb/day for all operations. ARB staff decided to use the AQST in South Coast AQMD for construction purposes. Most of the engines registered in PERP are located in South Coast and are used for construction purposes. The document from South Coast AQMD regarding their AQSTs is included in this appendix.

To calculate how much horsepower would trigger the notification requirement, ARB staff assumed that the worst case scenario for emissions would be a project with all Tier 2 engines, because the ATCM will require Tier 1 engines to be phased out by 2020. ARB staff also used the load factor and usage data from the portable engine emissions model. The formula to determine how much horsepower would be needed to emit 100 lb/day of NO_x is as follows:

x = amount of bhp
Operation of 12 hours/day
Load factor of 0.31

$$x \left(\frac{4.8 \text{ g NO}_x}{\text{hp-hr}} \right) (0.31) \left(\frac{1 \text{ lb}}{453.6 \text{ g}} \right) \left(\frac{12 \text{ hours}}{\text{day}} \right) = 100 \text{ lb NO}_x$$

$$x(0.0393648) = 100 \text{ lb/day}$$

Solving for x results in 2,540 bhp. ARB staff rounded to the nearest 100 bhp in the regulation language for expediency.



SCAQMD Air Quality Significance Thresholds

Mass Daily Thresholds ^a		
Pollutant	Construction ^b	Operation ^c
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk \geq 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas \geq 1 in 1 million) Chronic & Acute Hazard Index \geq 1.0 (project increment)	
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402	
GHG	10,000 MT/yr CO ₂ eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants ^d		
NO ₂ 1-hour average annual arithmetic mean	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour average annual average	10.4 $\mu\text{g}/\text{m}^3$ (construction) ^e & 2.5 $\mu\text{g}/\text{m}^3$ (operation) 1.0 $\mu\text{g}/\text{m}^3$	
PM2.5 24-hour average	10.4 $\mu\text{g}/\text{m}^3$ (construction) ^e & 2.5 $\mu\text{g}/\text{m}^3$ (operation)	
SO ₂ 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal – 99 th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 $\mu\text{g}/\text{m}^3$ (state)	
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Lead 30-day Average Rolling 3-month average	1.5 $\mu\text{g}/\text{m}^3$ (state) 0.15 $\mu\text{g}/\text{m}^3$ (federal)	

^a Source: SCAQMD CEQA Handbook (SCAQMD, 1993)

^b Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).

^c For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.

^d Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

^e Ambient air quality threshold based on SCAQMD Rule 403.

KEY: lbs/day = pounds per day ppm = parts per million $\mu\text{g}/\text{m}^3$ = microgram per cubic meter \geq = greater than or equal to
MT/yr CO₂eq = metric tons per year of CO₂ equivalents $>$ = greater than



South Coast
Air Quality
Management District

Air Quality Analysis for Large Projects Operating in South Coast Air Quality Management District

2017 PERP Air Quality Impact Analysis White Paper

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Introduction

Purpose and Objective

This white paper was drafted by South Coast Air Quality Management District (SCAQMD) staff. The intent of this white paper is to assist the public, industry, and local air districts in understanding key facts and policy issues related to the inclusion of an Air Quality Impact Analysis (AQIA) for projects with a cumulative 2,500 brake horsepower (bhp) of registered Internal Combustion Engines (ICE) in the California Air Resources Board (CARB) Portable Equipment Registration Program (PERP). The white paper includes information regarding criteria pollutant emissions that are associated with PERP registered ICEs used to power a wide variety of equipment, which includes generators, air compressors, pumps, cranes, and other construction equipment. For the purposes of this white paper the focus is on the emissions in air districts classified as extreme nonattainment for ozone.

Background

Attainment Challenge

Meeting U.S. Environmental Protection Agency (EPA) national ambient air quality standards (AAQS) for ozone and fine particulate matter will require additional emissions reductions for local air districts that have been designated by the EPA as extreme nonattainment. In order for these local air districts to attain the federal AAQS, local air districts need to consider all sources of emissions, which includes emissions from portable equipment.

Air Quality Impacts of Portable Equipment

There is a large quantity of portable equipment throughout the State of California. The equipment is necessary for all types of projects that include building roads, homes, hospitals, and other infrastructure. The need for portable equipment and compliance with all local air districts throughout the State of California was recognized and prompted the development of a uniform regulation for all local air districts to utilize. CARB designed PERP out of the need for those using portable equipment throughout the State of California. CARB recognized the need for air districts to comply with both federal and state AAQS and designed the PERP regulation to ensure that attainment of AAQS was not interfered with. There are approximately 29,492 ICEs registered in PERP and due to the portable nature of this type of equipment the challenge of accounting for

emissions has become difficult for local air districts to account for while trying to attain AAQS. Notification of projects using a cumulative 2,500 bhp will help air districts designated as extreme nonattainment for ozone to determine the impact of emissions from portable equipment by giving the option to those local air districts to perform an AQIA.

California Environmental Quality Act Vs AQIA

Ambient Air Quality Standard

The PERP regulation is proposing a notification requirement for projects with a total of 2,500 bhp or more of PERP registered ICEs in air districts that are designated as extreme nonattainment for ozone. One of the leading contributors to the formation of ground level ozone is oxides of nitrogen (NO_x). The AAQS for nitrogen dioxide (NO₂), a subset of NO_x is listed in Table 1.

Table 1:

Ambient Air Quality Standards for NO ₂		
Averaging Time	State Standard	Federal Standard
Annual	0.030 ppm	0.053 ppm
1 hour	0.18 ppm	0.100 ppm

The annual state and federal standards do not apply to PERP because PERP equipment is not allowed to operate in a location for more than 12 consecutive months. The state and federal 1-hour NO₂ standards do not have the same restriction. The state 1-hour standard is based on a maximum not to be exceeded level, while the federal 1-hour NO₂ standard is based on the 98th percentile averaged over three years. Since PERP equipment will not be allowed at a site for more than 12 consecutive months, the federal 1-hour NO₂ standard does not apply and for the purposes of this white paper, the 1-hour California Standard will be the focus of the AQIA analysis.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) was adopted in 1970. Its basic purposes are: to inform government decision makers and the public about the potential significant environmental effects of proposed activities; identify ways that environmental damage can be avoided or significantly reduced; require changes in projects through the use of alternatives or mitigation measures when feasible; and disclose to the public the reasons why a project was approved if significant environmental effects are involved.

Where an AQIA and a CEQA document differ is the focus of a project. The AQIA will focus only on the PERP registered engines at projects where there are a total of 2,500 bhp or more. The CEQA analysis focuses on all emission sources at a project regardless of the regulation that the equipment falls under. The AQIA that is proposed by the PERP regulation is supported by existing language in the PERP regulation in Title 13, California Code of Regulations, § 2455 (a) that prohibits interference of emissions from one or more registered engines or equipment units causing an exceedance of any AAQS. The AQIA is not mandatory, like CEQA, but is optional based on the local air districts' desire to perform the analysis. The AQIA notification would only be required in those local air districts that are designated as extreme nonattainment for ozone. The AQIA notification would be exempt from projects in remote locations and for projects exclusively using Tier 4 interim and Tier 4 final engines. Projects using a mix of Tiers 1 through 4 final engines would not be exempt and would require notification. In this case, all of the engines would be included in the AQIA. It is the intent of the local air districts that are designated as extreme nonattainment for ozone to achieve attainment of the AAQS and once the designation changes, no longer require the notification of these type of projects.

The use of PERP registered equipment is not always easy to predict during the planning stages of a project, when CEQA is typically contemplated and completed. It is often the case that the CEQA analysis for a project does not include some or all of the PERP registered equipment that will be used during construction. Previous experience has shown that projects exceeding the 2,500 bhp PERP notification level commonly do so due to unforeseen circumstances such as the lack of available electricity at the project site during construction, necessitating the need for large PERP equipment to supplement the power. Although the project has already undergone CEQA review, the use of the PERP equipment above 2,500 bhp has the potential to interfere with a local air district's ability to attain the applicable AAQS.

However, if a project has included the use of all PERP equipment in the air quality analysis (both regional and localized impacts) as part of the CEQA review, then the person responsible for the notification would only need to include the CEQA document (including all electronic input and output modeling files) with the notification to the local air district for review. It is anticipated that in these situations, the local air district would have already received the CEQA document and reviewed the associated air quality analysis files during the public comment period and only a cursory review would be needed.

In the event that the air quality analysis in the CEQA document did not include the use of PERP equipment in both the regional and localized analysis, then the air district could perform an AQIA to determine the air quality impacts and if the use of the 2,500 bhp of PERP equipment would interfere with attainment of AAQS.

Recommendations

AQIA Methodology

For projects that did not address PERP equipment that would total 2,500 bhp or more in their CEQA analysis, an AQIA will be necessary to examine whether the equipment is in compliance with the state 1-hour NO₂ AAQS. SCAQMD staff are developing a screening tool that can be used to estimate the 1-hour NO₂ concentration without the need for conducting air dispersion modeling. The screening tool is a spreadsheet that uses existing acute dispersion factors for diesel ICE's¹ with CARB off-road diesel engine emission factors² for NO_x to estimate the 1-hour NO₂ concentration based on the projected engine size and distance to the fence line. The existing acute dispersion factors represent the maximum 1-hour concentrations from all of the SCAQMD's meteorological datasets, and therefore are conservative. The screening tool then multiplies the emission rate by the dispersion factors to determine the 1-hour NO₂ concentrations at various downwind distances. The concentrations can then be compared to the 1-hour NO₂ state AAQS to determine if compliance is met. If compliance with the 1-hour NO₂ state AAQS is demonstrated through the screening tool, then the AQIA is complete and no further analysis is required.

If the screening tool determines that a project's PERP equipment would lead to an exceedance of the 1-hour NO₂ state AAQS, then a refined AQIA will need to be completed at the local air district's discretion. The refined AQIA should be completed using the latest regulatory version of U.S. EPA's AERSCREEN or AERMOD air dispersion models and follow the local air district's modeling guidance. A refined AQIA will typically result in less conservative dispersion factors as it is based on the actual project conditions and meteorology as well as allowing for adjustments to the hours of operation of the PERP equipment.

Determining Compliance

The goal has been and always will be to comply with the AAQS. The AQIA is one way local air districts that are designated as extreme nonattainment for ozone AAQS can achieve their attainment goals. It is not the intent of an AQIA to prevent or delay a project from starting or being completed. The AQIA is an option for local air districts that are designated as extreme nonattainment to analyze a project with 2,500 bhp or more of PERP registered equipment. If the local air district determines that the project would exceed an AAQS, the local air district can take steps to ensure that the project can be completed while still complying with the AAQS through the use of mitigation measures.

¹Table 6.31 of Appendix VII, "Tier 2 Screening tables for Combustion Sources (Natural Gas Boilers, Natural Gas Internal Combustion Engines, Diesel Internal Combustion Engines) For Use in Rule 1401," of the "Risk Assessment Procedures for Rules 1401, 1401.1 and 212". SCAQMD, Version 8.0, June 5, 2015.

²The emission factors for NO_x were taken from Title 13, Article 4.8, Chapter 9 of the California Code of Regulations Appendix A

Some examples of mitigation measures which could be implemented are to move equipment further away from the fence line and sensitive receptors; limit the number of hours the PERP registered equipment operate in a day; ensure that not all of the PERP registered equipment is operating at the same time; and any other options to reduce impacts and ensure that the project is in compliance with the state 1-hour NO₂ AAQS. Since all projects differ in scope and execution; it is in the best interest of the project and local air districts to determine compliance on a case by case basis.

Appendix A
Noncompliance with AAQS

Noncompliance with AAQS

Compliance Regulation

If all approved mitigation measures have been exhausted and a project is determined by the AQIA to be in exceedance of an AAQS, the PERP registered engines, except for Tier 4 final engines, shall not be valid at the location where the AQIA demonstrates that the operation of the registered engines will cause a violation of an AAQS¹. We do not anticipate that most projects will fall into this category but the applicable engines will be subject to local district permitting rules. If the engines are determined to be operating without a valid permit, the local district can take compliance action against the operator of the engine.

South Coast Air Quality Management District Compliance

The South Coast Air Quality Management District (SCAQMD) has avenues for resolving non-compliant projects in violation of an AAQS. One option for the operator is to petition for a Variance from the SCAQMD Hearing Board. The petitioner will need to present evidence demonstrating:

- That the petitioner for a variance is, or will be, in violation of the AAQS or district rules and regulations.
- Due to conditions beyond the reasonable control of the petitioner, requiring compliance would result in either:
 - An arbitrary or unreasonable taking of property, or
 - The practical closing and elimination of a lawful project.
- The shutting down of the project would be without a corresponding benefit in reducing air contaminants.
- The petitioner for the variance has given consideration to curtailing operations in lieu of obtaining a variance.
- During the period the variance is in effect, that the applicant will reduce excess emissions to the maximum extent feasible.
- During the period the variance is in effect, the applicant will monitor or otherwise quantify emission levels from the project, if requested to do so by the district, and report these emission levels to the district pursuant to a schedule established by the district.

There are four types of variances:

1. Emergency – When a situation develops without warning. The hearing Board may grant an emergency variance without public notice or hearing if good cause exists.

¹ Proposed PERP regulation Title 13, California Code of Regulations, § 2455(a)(3)

2. Interim – For immediate coverage other than for emergencies, an interim variance – which does not require a public notice period if good cause exists – can be obtained to cover the time until a hearing for a short or regular variance can be held.
3. Short – Companies that can achieve compliance within 90 days or less should request a short variance. A short variance requires a 10-day posted notice period.
4. Regular – Companies that need more the 90 days to comply should request a regular variance. The variance period is usually one year or less, but can be longer if a specific compliance schedule is set. An application for a regular variance must be filed at least 30 days before the request can be heard.

If an operator chooses not apply for a variance or is denied such variance and chooses to operate out of compliance with an AAQS therefore making the PERP registrations invalid, and operates without first obtaining a SCAQMD Permit to Operate, the SCAQMD can issue a Notice of Violation (NOV) to the operator for Rule 203(a). Each day or part of a day that an operator is in violation is a separate violation and is subject to civil penalties. Continued operation in noncompliance without a variance can result in additional violations.

The SCAQMD can also seek an Order of Abatement through the SCAQMD Hearing Board for a company operating out of compliance to take specific actions or to shut down its operation. This is a severe remedy normally reserved for serious violators.

The SCAQMD Hearing Board may, after notice and a hearing, issue an order if the Hearing Board finds both a violation of a rule or regulation and “good cause” to grant the order².

The SCAQMD is also authorized to issue “Stipulated Orders of Abatement.” A stipulated order has the same legal effect as a regular Order of Abatement, but includes the agreement, or “stipulation” of the Executive Officer through the Office of the General Counsel with the company alleged to operating out of compliance. There are two critical differences in the issuance of a Stipulated Order of Abatement:

1. The Hearing Board is not required to find that a facility is in violation of any rule or regulation; and
2. The conditions of the order are agreed upon in advance by the parties.

The goal of the AQIA is to ensure compliance with the AAQS. SCAQMD’s preference is to exhaust all possible mitigation measures prior to taking compliance actions. If a compliance action is taken the purpose is not to delay or prevent the project from its anticipated completion date but to reach an agreeable solution to which the project can be completed with the least amount of emissions as possible.

² California Health and Safety Code §§ 42450 and 42451