

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Addendum to the 2007 Final Environmental Assessment for Proposed Amended Rule 1110.2 – Emissions from Gaseous - and Liquid-Fueled Engines

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INTRODUCTION

The California Legislature created the South Coast Air Quality Management District (SCAQMD) in 1977¹ as the agency responsible for developing and enforcing air pollution control rules and regulations in the South Coast Air Basin (Basin) and portions of the Salton Sea Air Basin and Mojave Desert Air Basin referred to herein as the district. The 2007 AQMP concluded that major reductions in emissions of particulate matter (PM), oxides of sulfur (SOx) and oxides of nitrogen (NOx) are necessary to attain the state and national ambient air quality standards for ozone, particulate matter with an aerodynamic diameter of 10 microns or less (PM10) and particulate matter with an aerodynamic diameter of 2.5 microns or less (PM2.5). More emphasis is placed on NOx and SOx emission reductions because they provide greater ozone and PM emission reduction benefits than volatile organic compound (VOC) emission reductions. VOC emission reductions, along with NOx emission reductions, continue to be necessary, because emission reductions of both of these ozone precursors are necessary to meet the ozone standards.

Existing Rule 1110.2 - Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines, regulates NOx, carbon monoxide (CO), and volatile organic compound (VOC) emissions from stationary and portable engines in the district producing more than 50 rated brake horsepower (bhp). It was originally adopted in 1990 and amended in 2008 to implement, in part, the 2007 AQMP Control Measure MCS-01 – Facility Modernization.

The currently proposed amendments would make effective certain limits already adopted and analyzed in a California Environmental Quality Act (CEQA) document for the amendments to Rule 1110.2 adopted in 2008, which established new exhaust emission concentration limits for landfill and digester gas-fired engines to take effect July 1, 2012. These limits did not take effect because they were contingent upon completion of a technology assessment by July 2010. Except for CO, the emission standards would be equivalent to the current best available control technology (BACT) for NOx and VOC for new internal combustion engines. Among the engines affected by the 2008 amendments were approximately 55 engines that are fired by landfill or digester gas (biogas), located at 13 public and private landfills and wastewater treatment plants.

Subsequent to the 2008 amendments, Rule 1110.2 was last amended in 2010 to exempt public safety communications engines located at remote sites. The currently proposed amendments would have no effect on the provisions added to Rule 1110.2 in 2010, so this Addendum does not need to consider the 2010 amendments to Rule 1110.2 further.

The adopting resolution for the 2008 amendments to Rule 1110.2 directed staff to conduct a technology assessment before July 2010 to address the feasibility of achieving the July 1, 2012 compliance limits for biogas-fueled engines. However, the permit moratorium in 2009 caused a delay in the startup of demonstration projects designed to test whether or not the final compliance limits were feasible. Because of this delay, SCAQMD staff presented an *Interim Report on the Technology Assessment for Rule 1110.2 Biogas Engines* to the Governing Board in July 2010. The interim report pointed to two potential technologies that were being evaluated in the continuing demonstration projects that were part of the technology demonstration. One demonstration project has since been completed, but the other demonstration project's startup

¹ The Lewis-Presley Air Quality Management Act, 1976 Cal. Stats., ch 324 (codified at Health & Safety Code, §§40400-40540).

has been affected by other unforeseen delays. Given the delays in completing the demonstration projects at that time, the Interim Technology Assessment mentioned the possible necessity of an adjustment to the July 1, 2012 effective date to allow additional time for the completion of the technology assessment.

The proposed amendments would:

- Allow biogas facility operators/owners three and a half to six additional years to comply with the emission limits that did not take effect. The new effective date would be January 1, 2016. Permit application fees would be refunded to biogas-fueled engines owner/operators who establish to the satisfaction of the Executive Officer that they have complied with the emission limits of Table III-B by January 1, 2015. Owners or operators of biogas-fired units that operate under long term fixed price power purchase agreements that have been entered into prior to February 1, 2008, and extend beyond January 1, 2016 may elect to defer compliance by up to two additional years and no later than January 1, 2018 provided that they submit an alternative compliance plan and pay a compliance flexibility fee. The compliance flexibility fees associated with the alternative compliance plan would be applied to SCAQMD NOx reduction programs pursuant to protocols approved under SCAQMD rules.
- Provide a compliance option with a longer averaging time, provided that the engine operator can demonstrate through continuous emission monitoring systems (CEMS) that emissions are at least 9.9 ppmv for NOx and 225 ppmv for CO.

The proposed amendments are described in more detail in the “Project Description” section below and in Appendix A to this Addendum.

SCAQMD staff has met with stakeholders and the affected community to discuss the feasibility and cost effectiveness of the control technologies expected to be used to comply with the biogas-fueled engine requirements of Rule 1110.2. SCAQMD staff has also met individually with most affected facility operators to discuss site-specific issues relative to complying with the proposed emission limits for biogas-fueled engines. These discussions are ongoing.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The proposed amendments to Rule 1110.2 are considered to be a "project" as defined by the California Environmental Quality Act (CEQA). CEQA requires that the potential adverse environmental impacts of proposed projects be evaluated and that feasible methods to reduce or avoid significant adverse environmental impacts of these projects be identified. To fulfill the purpose and intent of CEQA, the SCAQMD, as the CEQA Lead Agency for the proposed project has prepared this Addendum to the 2007 Final Environmental Assessment for Proposed Amended Rule 1110.2 - Emissions from Gaseous- and Liquid-Fueled Internal Combustion Engines (SCAQMD No. 280307JK, December 2007) (2007 Final EA) adopted February 1, 2008, which included an evaluation of environmental impacts from amending Rule 1110.2, cumulative impacts, project alternatives, and all other applicable CEQA requirements.

Analysis of the proposed project indicated that an Addendum to the 2007 Final EA prepared pursuant to CEQA Guidelines §15164 is the appropriate CEQA document for this project, because SCAQMD staff has concluded that the proposed amendments only result in some changes or additions to the 2007 Final EA that do not trigger the conditions described in CEQA Guidelines §15162 calling for preparation of a subsequent EIR:

1. No substantial changes are proposed in the project which required major revision of the previous CEQA document due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
2. No substantial changes would occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous CEQA document due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. No new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous CEQA document was certified as complete shows any of the following:
 - A. One or more significant effects not discussed in the previous CEQA document;
 - B. Significant effects previously examined with be substantially more severe than shown in the previous CEQA document;
 - C. Mitigation measures or alternatives previously found not to be feasible would be in fact feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the migration measure or alternative; or
 - D. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the migration measure or alternative.

Based on the analysis in this addendum, PAR 1110.2 would not generate new significant environmental effects or a substantial increase in the severity of previously identified significant effects. Since PAR 1110.2 would not generate new significant environmental effects or as substantial increase in the severity of previously identified significant effects, no new mitigation measures or alternatives have been proposed. No changes to existing mitigation measures or alternatives are proposed. This conclusion is supported by substantial evidence provided as part of the environmental analysis in this Addendum and other documents in the record.

Thus this Addendum, prepared pursuant to CEQA Guidelines §15164, focuses on the topic of air quality and GHG emissions, specifically operational air quality impacts. Although the currently proposed project would delay the final compliance limits for biogas engines, this proposal is not considered a rule relaxation for the following reasons. The 2008 amendments to Rule 1110.2 included a provision that the emission limits for biogas-fueled engines would only become effective provided that SCAQMD staff conducts a technology assessment and reports to the Governing Board by July 2010. Because the technology assessment was not completed by July 2010, the emission limits for biogas engines are not considered to be in effect.

The analysis of these potential environmental impacts did not identify any significant adverse environmental impacts, including operational air quality impacts, or make worse any previously identified significant adverse impacts from the 2007 Final EA. Thus, an Addendum to the 2007 Final EA is considered to be the appropriate CEQA document for the proposed project. In addition, pursuant to CEQA Guidelines §15252(a)(2)(B), no project alternatives or mitigation measures are proposed. Prior to making a decision on the proposed amendments to Rule 1110.2, the SCAQMD Governing Board must review this Addendum along with the 2007 Final EA.

PROJECT LOCATION

The SCAQMD has jurisdiction over an area of 10,473 square miles (referred to hereafter as the district), consisting of the four-county South Coast Air Basin and the Riverside County portions of the Salton Sea Air Basin (SSAB) and the Mojave Desert Air Basin (MDAB). The Basin, which is a subarea of the SCAQMD’s jurisdiction, is bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The 6,745 square-mile Basin includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties. The Riverside County portion of the SSAB and MDAB is bounded by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley. The federal nonattainment area (known as the Coachella Valley Planning Area) is a subregion of both Riverside County and the SSAB and is bounded by the San Jacinto Mountains to the west and the eastern boundary of the Coachella Valley to the east (Figure 1).



Figure 1
Boundaries of the South Coast Air Quality Management District

PROJECT OBJECTIVES

One of the original project objectives of the 2008 amendments to Rule 1110.2 analyzed in the 2007 Final EA was to achieve NOx emission reductions from affected equipment through imposing control requirements close to BACT in effect at that time, contingent upon a technology assessment presented to the Governing Board in July 2010. A final technology assessment was not available in July 2010, so the original project objective needs to be amended to allow an additional time for biogas-fueled engines to comply with the final biogas-fueled engine emission concentration limits in the existing rule that have been verified a final technology assessment. PAR 1110.2 would continue to adhere to this objective, but allow additional time for operators at facilities with biogas-fueled engines to comply with the proposed biogas concentration limits. Further, the results of OCSD’s pilot study shows greater flexibility in complying with the final NOx emission limits is necessary. To this end, to facilitate achieving the above objective, PAR 1110.2 would provide greater flexibility in demonstrating compliance with the final NOx emission limits by extending the compliance testing averaging time.

PROJECT BACKGROUND – BIOGAS-FUELED ENGINES

Rule 1110.2 applies to stationary and portable reciprocating internal combustion engines (ICEs) over 50 brake horsepower (bhp); therefore, Rule 1110.2 regulates biogas-fueled engines. Biogas-fueled engines are engines that operate at landfills and wastewater treatment plants. Biogas-fueled engines are lean-burn engines that operate similarly to lean-burn natural gas-fired engines.

Biogas is generated from the breakdown of municipal solid waste at landfills. Biogas from landfills is primarily composed of methane, carbon dioxide, and contaminants such as siloxane and hydrogen sulfide (H₂S). The gas is collected in a series of wells and transported by pipeline to treatment facilities where it is filtered, dewatered, and compressed prior being combusted in the landfill-gas fired engines. Depending on the volume and methane content of the landfill gas collected, it can be used to fuel one or more biogas-fueled engines. If the methane content of the landfill gas is relatively low or the volume collected is low, natural gas, may be used as a supplemental fuel to increase the heat content of the digester gas.

Biogas is also generated at wastewater treatment facilities in digesters. A digester is a process unit in which sewage is broken down by bacteria in a heated oxygen-free (anaerobic) environment. A by-product of this process is biogas that contains methane, CO₂, and small amounts of H₂S. The treatment of biogas may include removal of components including hydrogen sulfide, water, carbon dioxide, trace organics, and particulates. This digester gas can typically fuel one or more biogas-fueled engines. Natural gas may be used as a supplemental fuel to increase the heat content of the landfill gas.

Biogas-fueled engines are typically used to produce electricity. Some owner/operators use the biogas-generated electricity to provide power for their facility. Other owner/operators sell the biogas-generated power to local electric utility providers. Wastewater treatment plants are typically operated by public entities and utility providers, while the landfills are operated by either public or private operators.

Approximately 66 biogas-fueled engines with SCAQMD permits were identified in the 2010 Interim Technology Assessment. Since that time, some biogas-fueled engines have been removed from service, so the number of biogas-fueled engines remaining at the beginning of the PAR 1110.2 development process has decreased to 55. These 55 engines are located at 22 public and private landfills and wastewater treatment plants under the ownership of 13 operators. These biogas-fueled engines are among the top NO_x emitters among stationary, non-emergency engines. As shown in Table 1, based on annual reporting data from 2010, 13 of the top 25 NO_x emitters are stationary, non-emergency engines at biogas facilities.

Table 1
“Top 25” Facilities with Highest NOx Emissions from Stationary,
Non-Emergency Engines (Pounds per Year) in 2010

Facility	ID No.	NOx	ROG	CO	Fuel(s)
U.S. Govt, Dept Of Navy	800263	110,713	8,967	24,390	Diesel
U.S. Govt, Dept Of Navy	800263	80,714	9,701	26,387	Diesel
Exxonmobil Oil Corporation	800089	69,961	5,594	15,215	Diesel
<u>La County Sanitation District-Puente Hills</u>	25070	52,796	18,068	284,104	Landfill Gas
<u>Orange County Sanitation District</u>	29110	48,912	68,945	611,663	Digester Gas
<u>Orange County Sanitation District</u>	17301	41,478	43,767	426,682	Digester Gas
U.S. Govt, Dept Of Navy	800263	38,469	3,827	10,408	Diesel
Crimson Resource Management	142517	38,093	507	64,119	Natural Gas (Rich-Burn)
<u>Mm Lopez Energy Llc</u>	104806	35,662	10,707	142,482	Landfill Gas
<u>Mm Prima Deshecha Energy, LLC</u>	117297	32,599	6,321	127,325	Landfill Gas
<u>Mm Prima Deshecha Energy, LLC</u>	117297	31,474	14,005	141,724	Landfill Gas
Exxonmobil Oil Corporation	800089	28,192	2,254	6,131	Diesel
<u>Mm Lopez Energy LLC</u>	104806	28,189	11,753	110,606	Landfill Gas
U.S. Govt, Dept Of Navy	800263	21,923	2,181	5,931	Diesel
Eop - 10960 Wilshire LLC	119133	20,083	267	33,805	Natural Gas (Rich-Burn)
Hollywood Park Land Company LLC	145829	19,792	1,583	4,304	Diesel
Samuel P Lewis DbA Chino Welding & Assem	150351	19,542	260	32,894	Natural Gas (Rich-Burn)
<u>Toyon Landfill Gas Conversion LLC</u>	142417	18,000	9,991	100,575	Landfill Gas
Orange, County Of - Sheriff Dept, Fac Op	72525	17,314	499	1,344	Natural Gas (Lean-Burn)
<u>Brea Parent 2007, LLC</u>	113518	17,033	1,099	4,555	Landfill Gas
Huntington Beach City, Water Dept	20231	15,370	205	25,871	Natural Gas (Rich-Burn)
<u>Brea Parent 2007, LLC</u>	113518	15,346	784	3,140	Landfill Gas
<u>Brea Parent 2007, LLC</u>	113518	14,181	1,052	4,958	Landfill Gas
<u>Waste Mgmt Disp & Recy Servs Inc (Bradley)</u>	50310	13,934	3,465	60,087	Landfill Gas
<u>Waste Mgmt Disp & Recy Servs Inc (Bradley)</u>	50310	13,839	3,823	67,514	Landfill Gas
Totals, pound per year		843,607	229,624	2,336,216	
Totals, ton per year		422	115	1,168	
Totals, ton per day		1.16	0.31	3.20	

PROJECT DESCRIPTION

The following is a summary of the proposed amendments to Rule 1110.2. A copy of PAR 1110.2 can be found in Appendix A.

Subdivision (a) - Purpose

No change.

Subdivision (b) - Applicability

No change.

Subdivision (c) - Definitions

The type “by” is corrected to “be” in the useful heat recovered definition.

Subdivision (d) - Requirements

- Requirement (d)(1)(B) would be clarified to read “The operator of any stationary engine not covered by (d)(1)(A) and not exempt from this rule shall...”
- Table III would be split into two tables. The concentration limits in Table III that became effective when the 2008 amendments were adopted would become Table IIIA. The concentrations in Table III labeled effective July 1, 2012 would become Table III-B. The effective date for those concentration limits would be changed from July 1, 2012, to January 1, 2016.
- Table III-A or B would be added to the existing Table II in the prohibition not to exceed applicable emissions concentration limits in (d)(1)(B)(ii), so the phrase “notwithstanding the provisions in subparagraph (d)(1)(B)” would be removed in (d)(1)(C).
- The existing reference to Table III in (d)(1)(C) would be changed to Table III-A, since Table III-A would be split into Table III-A and Table III-B.
- “The concentration limits effective on and after July 1, 2012 shall become effective provided the Executive Officer conducts a technology assessment that confirms that the limits are achievable, and reports to the Governing Board by July 2010, at a regularly scheduled public meeting,” would be removed from subparagraph (d)(1)(C).
- Subparagraph (d)(1)(D) would be added that states that notwithstanding the provisions of subparagraph (d)(1)(B), the operator of any stationary engine fired by landfill or digester gas (biogas) shall not operate the engine in a manner that exceeds the emission concentration limits in Table III.
- Provision (d)(1)(E) would be added that states that biogas engines operators that have established that they have complied with emissions limits of Table III-B by January 1, 2015 would have their respective engine permit application fees refunded.
- The provision in Subparagraph (d)(1)(C) that states that there shall be no limit on the percentage of natural gas burned, once a engine complies with concentration limits effective on and after July 1, 2012, would be deleted and replaced with provision (d)(1)(F), which states once an engine complies with the concentration limits in Table III-B of the proposed amended rule, there would be no limit on the percentage of natural gas burned.
- The effective date of the rule provision that would exclude engines that operate less than 500 hours per year or use less than 1,000,000,000 Btus per year (higher heating value) of fuel on or after July 1, 2012, would be deleted from (d)(1)(C) and replaced with a new subparagraph (d)(1)(G) that states that the concentration limits in the Table III-B shall not apply to engines that operate less than 500 hours per year or use less than 1,000,000,000 Btus per year (higher heating value) of fuel.

- An operator of a biogas engine would be allowed to determine compliance with the NOx and/or CO limits of Table III-B by utilizing a longer averaging time as set forth in the proposed rule, provided that the operator demonstrates through CEMS data that the engine is achieving a concentration at or below 9.9 ppmv for NOx and 225 ppmv for CO (each corrected to 15 percent oxygen) over a four month time period. The operator would be allowed to use a monthly averaging time for the first four months of engine operation and up to a 12 hour averaging time thereafter. Additional requirements pertaining to CEMS monitoring related to this provision are included.
- Internal section references were updated to account for changes to section numbering caused by the proposed amendments.

Subdivision (e) - Compliance

No change.

Subdivision (f) – Monitoring, Testing, Recordkeeping and Reporting

A clarification would be made to (f)(1)(D)(iii)(I) that states that a return to a more frequent emission check schedule would not be required when making adjustments to the oxygen sensor set points if the engine is in compliance with the applicable emission limits prior to and after the set points adjustments, notwithstanding the requirements of (f)(1)(D)(iii)(IV).

Subdivision (g) – Test Methods

No change.

Subdivision (h) – Alternative Compliance Option

- In lieu of complying with the applicable emissions limits by the effective dates specified in Table III-B, owners/operators of affected biogas-fired units that operate under long term fixed price power purchase agreements that have been entered into prior to February 1, 2008 and extend beyond January 1, 2016 may elect to defer compliance by up to two years and no later than January 1, 2018, provided the owners/operators submit an alternative compliance plan and pay a compliance flexibility fee to the Executive Officer at least 150 days prior to the applicable compliance date in Table III-B, and maintains an on-site copy of verification of the compliance flexibility fee payment and SCAQMD approval of the alternative compliance plan available upon request to SCAQMD staff.
- The alternative compliance plan would be required to include a completed SCAQMD Form 400A; attached documentation of unit permit ID, unit rated brake horsepower, and fee calculation; filing fee payment; and compliance flexibility fee payment. The SCAQMD Form 400 A would need to identify that the request is for a compliance plan and identification that the request is for the Rule 1110.2 Compliance Flexibility Fee option.
- The compliance flexibility fees associated with the alternative compliance plan would be applied to SCAQMD NOx reduction programs pursuant to protocols approved under SCAQMD rules.

Subdivision (i) - Exemptions

Exemption (i)(10) would be clarified to include engine shutdown periods, as well as, engine start up periods.

CONTROL TECHNOLOGIES

Pre-combustion Biogas Cleanup Technologies

Biogas, whether coming from a wastewater treatment plant digester or from a landfill, has many impurities, including but not limited to sulfur-containing compounds and siloxane, that require treatment (filtered, dewatered, and compressed) before combustion. If left untreated, raw biogas can damage engine components that may result in more maintenance and ultimately, over time, reduce the useful life of the engine. For example, siloxane can crystallize as silicon dioxide in the combustion stage and become deposited in fuel lines and engine parts. As a result, more frequent major maintenance on engines may be required to clean deposits from untreated biogas within the engine. Failure to perform this maintenance may result in catastrophic failure of an engine. The pretreatment of biogas is even more critical for catalyst-based after-treatment technologies for engines. If left untreated, impurities such as siloxane may result in the rapid poisoning of the catalyst downstream of the engine. Poisoning of catalysts is defined as the deposition of silica on the active sites of the catalyst which reduces the efficiency of the catalyst.

As described in the Interim Technology Assessment, there are two types of siloxane removal systems, regenerative and non-regenerative. Regenerative siloxane removal systems do not require constant removal of the sorbent material from its vessel. It is regenerated using a heated purge gas. Typically there are two vessels, so one can be regenerated, while the second vessel continues to clean siloxane. The Ox Mountain Landfill has the only regenerative siloxane removal system in use for the protection of a post-combustion catalyst. Ox Mountain Landfill is located at Half Moon Bay, California, which is within the Bay Area Air Quality Management District's (BAAQMD) jurisdiction. The landfill gas to energy site (operated by Ameresco) has six GE-Jenbacher engines, each rated at 2,677 brake horsepower that are fired on landfill gas. All six engines have been retrofitted with oxidation catalysts, while one of the engines also has an SCR system. A temperature swing adsorption (TSA) regenerative siloxane removal system manufactured by GE-Jenbacher is used. Two adsorption beds of regenerative activated carbon are alternatively regenerated by using heat. The gas cleanup and oxidation catalyst/SCR systems were commissioned in 2009 and have shown to be very effective in the removal of siloxane from the landfill gas. Performance data shows that the system is removing between 95 and 99 percent of inlet siloxane.

Non-regenerative siloxane removal systems require periodic replacement of the adsorbent material (activated carbon or silica gel) once it is spent. Two beds of adsorbent are used, so one can be recharged with fresh adsorbent while the other removes siloxane. These systems are sized to handle site-specific siloxane loads. Greater amounts of adsorbent are required for biogas streams with higher levels of siloxane. The amount of adsorbent must be able to handle intermittent spikes in the biogas stream.

Control Technology for Internal Combustion Engines Analyzed in the 2007 Final EA

Potential impacts from using the following types of internal combustion engine control technologies were comprehensively analyzed in the 2007 Final EA previously certified by the SCAQMD Governing Board. As a result, even though operators of biogas-fueled engines affected by PAR 1110.2 may ultimately install these types of control technologies to comply with the emission reduction requirements, no further analysis of potential secondary impacts that may be generated by these control technologies is required. The following information is included for completeness only.

Catalytic Oxidation/Selective Catalytic Reduction

Proven and effective technologies for CO, VOC, and NO_x control among natural gas fueled lean-burn engines include catalytic oxidation with selective catalytic reduction. If the raw biogas is cleaned sufficiently and effectively, there is little danger of fouling any post combustion catalyst by siloxane deposition.

Catalytic oxidation removes CO and VOC by chemical reactions facilitated by the catalyst. Oxidation catalysts contain precious metals that assist CO and VOC to react with oxygen to produce CO₂ and water vapor. Catalytic oxidation can reduce CO and VOC emissions by greater than 90 percent.

SCR can be used with lean-burn engines since the higher oxygen concentrations in the exhaust preclude the use of less costly nonselective catalytic reduction (NSCR). SCR requires the injection of a reducing agent, typically urea or ammonia, to react with the NO_x in the engine's flue gas, producing water vapor and nitrogen gas as the end products. The SCR catalyst promotes the reaction of urea or ammonia with NO_x and oxygen, and is a very effective NO_x control technology.

NO_xTech

NO_xTech is another post combustion control technology, which does not require a catalyst, does not require gas cleanup, and is capable of achieving multi-pollutant control of NO_x, VOC, and CO emissions. Engine exhaust gases enter the unit where the temperature is raised by a heat exchanger. The gases then enter a reaction chamber where a small amount of the engine's fuel is added to raise the gas temperature to between 1400 and 1500 degrees Fahrenheit. At this temperature the NO_x reduction in the reaction chamber can occur using urea injection, while CO and VOC emissions are simultaneously incinerated. The system is designed to handle biogas that is of a lower Btu content than higher Btu content natural gas.

Biogas-fueled Engines – Replacement Technologies

The cost of compliance (CEMS, I&M, add-on control technology, etc.) may make it less costly to remove the existing biogas-fueled ICEs and replace them with other technologies. These technologies include boilers, gas turbines, microturbines, fuel cells and biogas-to-LNG systems. Replacing ICEs with the technologies described below means they would no longer be subject to the requirements of PAR 1110.2, but may be subject to other source-specific rules or regulations such as Regulation XIII – New Source Review.

Potential impacts from replacing biogas-fueled engines with the following replacement technologies were comprehensively analyzed in the 2007 Final EA previously certified by the SCAQMD Governing Board. As a result, even though operators of biogas-fueled engines affected by PAR 1110.2 may ultimately install these types of replacement technologies to comply with the emission reduction requirements, no further analysis of potential secondary impacts that may be generated by these control technologies is required. The following information is included for completeness only.

Fuel Cells

Fuel cells are an emerging technology capable of producing power with very low pollutant emissions without the utilization of combustion. Fuel cells can produce electricity much more

efficiently than combustion-based engines and turbines. A fuel cell uses a molten carbonate cell or other media to create an electrochemical reaction with the inlet biogas at the anode and oxygen from air at the cathode. Hydrogen is created in a reforming process at the anode, while carbonate ions are created at the cathode. The hydrogen gas reacts with the carbonate ions to produce water and electrons. These electrons flow through an external circuit that produces the electricity for the power plant.

The electrochemical reactions are produced in individual molten carbonate electrolyte stacks. The stacks are modular in design, so the total power production capacity of the generating plant can be tailored to accommodate several fuel cell stacks to meet the desired power output. The heat generated by the fuel cells can also be recovered and used to provide process heat. For instance, the recovered heat can be used to supply heat to a wastewater treatment plant's anaerobic digesters. The fuel cell stacks, however, are sensitive to impurities, so a biogas cleanup system is critical to maintain the performance of the fuel cell stacks. Siloxane can foul a fuel cell.

There are many fuel cell installations that run on natural gas, and there are also several in California that operate on biogas.

Flex Energy

Flex Energy is a system that combines microturbine technology with that of regenerative thermal oxidation to produce power with an ultra low emissions profile and without the necessity of biogas cleanup. The system is capable of taking low Btu content biogas that would be otherwise incombustible by any engine or turbine and diluting it before introducing it to the thermal oxidizer that raises the temperature to destroy VOC and CO. The thermal oxidizer's temperature is also not raised high enough to facilitate the formation of thermal NO_x. This process results in the consumption of methane gas without the pollutants from traditional combustion.

A typical internal combustion engine that runs on landfill gas will not operate efficiently if the methane content of the biogas drops below 35 to 40 percent. Landfills that produce gas with a methane content lower than what an engine typically needs to operate, will typically combust the gas with a flare. An advantage of the Flex Energy system is that it is capable of handling biogas with a methane content equivalent to and below a typical engine's range of consumption. An open landfill will often produce biogas with a constant amount of methane, roughly 50 percent. The other 50 percent of landfill biogas is typically CO₂. However, once a landfill ceases to accept municipal solid waste, the amount of biogas produced by the landfill will gradually begin to decay and the methane content will decline. A Flex Energy system can consume landfill gas well after a landfill closes at a lower methane content compared to other types of engines.

Another advantage with this type of system is that it does not require a fuel cleanup system for siloxane and other impurities. Like the fuel cells, these systems can be modularly applied, based on the inlet characteristics of the biogas and desired power output.

Other Combustion Technologies Analyzed in the 2007 Final EA

Potential impacts from replacing biogas-fueled engines with the following types of combustion technologies were comprehensively analyzed in the 2007 Final EA previously certified by the SCAQMD Governing Board. As a result, even though operators of biogas-fueled engines affected by PAR 1110.2 may ultimately install these other types of technologies to comply with

the emission reduction requirements, no further analysis of potential secondary impacts that may be generated by these control technologies is required. The following information is included for completeness only.

Traditional gas turbines, microturbines and boilers fall under this category and typically have lower emission profiles overall than biogas-fueled engines. Several landfills in the Basin currently employ the use of gas turbines for combustion of the biogas and also require extensive gas cleanup to protect the turbine blades from siloxane buildup. For example, the Calabasas Landfill operated by Los Angeles County Sanitation District and the Brea-Olinda Landfill currently use gas turbine technology with gas cleanup for handling landfill produced biogas. Traditional boilers can also process biogas and currently are being used by both landfills and wastewater treatment plants across the basin. For example, if a facility that operates both engines and boilers chooses to shut down its engines, the remaining biogas can usually be handled by its boilers and any excess can be routed to the existing facility flare, if necessary. Boilers are less sensitive to impurities and do not require extensive gas cleanup.

Liquefied Natural Gas (LNG) Facilities

Potential impacts from replacing biogas-fueled engines with LNG facilities were comprehensively analyzed in the 2007 Final EA previously certified by the SCAQMD Governing Board. As a result, even though operators of biogas-fueled engines affected by PAR 1110.2 may ultimately install these types of control technologies to comply with the emission reduction requirements, no further analysis of potential secondary impacts that may be generated by these control technologies is required. The following information is included for completeness only.

Biogas-to-LNG systems convert biogas to LNG and CO₂. LNG is created when natural gas is cooled to minus 260 degrees Fahrenheit, reducing six-hundred cubic feet of gas into one cubic foot of liquid methane. This process consists of several stages of compression and cooling. LNG plants would consist of a power generation building, programmable logic control/motor control center building, compression skids, refrigeration skids, liquefier skids, storage tanks and loading equipment. The plant is typically composed of vessels, compressors, pipes, valves, filters, coolers, instruments and process components in six modules: purification, CO₂ removal, refrigeration, liquefaction and post purification, instrument air, and controls. An LNG storage and dispensing system is needed to transfer LNG from the facility to trucks.

The LNG facility at the Frank R. Bowerman Landfill in Irvine, California was used as a basis for the analysis in the 2007 Final EA.² The Bowerman facility uses biogas-fueled turbines to supply power to the LNG facility. Since LNG systems are assumed to replace existing ICEs at affected facilities, it was assumed that facility operators who choose to install LNG plants in place of existing ICEs would use electricity from the power grid. Since the LNG facility would require some energy in the form of heat, it was assumed that operators who replace existing ICEs at affected facilities would install boilers to generate heat for the facility.

² Prometheus Energy Company, Bowerman I Natural Gas Process Facility Project Description, prepared for SCAQMD, undated.

The Bowerman facility has a LNG storage tank that can store five days worth of LNG generated at the facility. Dr. John Barclay of Prometheus Energy has stated that typical design of LNG storage tanks includes a capacity of three days.³

Flares

All facilities in the district that would be subject to PAR 1110.2 currently use flares onsite, either as one means of controlling landfill gas or as a backup to other types of biogas control or combustion technologies for use in event of emergency shutdowns or shutdowns for maintenance. Replacing existing biogas-fueled engines with flares, which means the equipment would no longer be subject to Rule 1110.2, was considered for analysis in the 2007 Final EA, but was rejected because, at the time, it was considered to be unlikely that operators of biogas-fueled engines would remove the biogas-fueled engines in favor of using flares. Recent information indicates that there is a potential to replace biogas-fueled engines with flares. Consequently, the analysis of potential adverse environmental impacts from switching from biogas-fueled engines to flares as a result of adopting PAR 1110.2 is the main focus of this Addendum. Therefore, the following paragraph provides a brief description of a landfill gas flare.

The major components of a flare are gas burner, stack, liquid trap, controls, pilot burner, and ignition system. Some flares are equipped with automatic pilot ignition systems, temperature sensors, and air and combustion controls. Flare combustion efficiency is related to flame temperature, residence time of gases in the combustion zone, turbulent mixing of the combustion zone, and amount of oxygen available for combustion. The temperature of exhaust gases from flares can range from 1,000 to 2,000 degrees Fahrenheit.

Flares are often the last resort for any facility that handles biogas, but cannot combust it with other means because of an insufficient quantity or methane content. With flaring, a facility can achieve VOC destruction from combustion, while many newer BACT flares achieve low NOx emissions. Although flares are used to combust methane to produce CO₂, which has a lower global warming potential, PAR 1110.2 has the potential to create CO₂ emission impacts, which will be discussed elsewhere in this document.

DISCUSSION AND EVALUATION OF ENVIRONMENTAL IMPACTS

Implementation of the biogas-fueled engine NOx concentration limits adopted in 2008 were conditional on preparation of a technology assessment verifying that the NOx concentration limits could be achieved by affected engines. Further, the technology assessment was required to be presented to the Governing Board at the July 2010 Public Hearing. Because the technology assessment was not completed in time for the July 2010 Public Hearing, the biogas-fueled engine NOx concentration limits did not become effective; therefore, the NOx concentration limits from the previous version of Rule 1110.2 remained in effect. As a result, NOx emission reductions associated with biogas-fueled engines cannot be claimed for the 2008 amendments to Rule 1110.2. Consequently, adopting NOx concentration limits for biogas-fueled engines with later compliance dates than those in the 2008 amendments to Rule 1110.2 means that previously quantified emission reductions for biogas-fueled engines are not considered to be foregone or delayed.

³ Phone conversation between Dr. John Barclay, Chief Technology Officer of Prometheus Energy Company and James Koizumi of SCAQMD, August 1, 2007.

The December 2007 Final EA assumed that operators of biogas-fueled ICEs would retrofit their engines with SCRs and catalytic oxidization systems or NOxTech systems. However, the December 2007 Final EA also evaluated the environmental impacts from the replacement of biogas-fueled ICEs with gas turbines, microturbines, or LNG plants. Options where landfill gas systems were replaced with LNG plants and digester gas systems with either turbines or microturbines were also evaluated. If, as part of the proposed amendments, operators choose to replace biogas-fueled ICEs with any of the above identified technologies, potential adverse environmental impacts from the technologies evaluated in the December 2007 Final EA would be the unchanged, although they would occur later because of the proposal to set the final compliance date as January 1, 2016 or January 1, 2018 under the alternative compliance option. Therefore, because impacts from the above technologies were already analyzed in the 2007 Final EA and are not expected to change as a result of adopting the currently proposed amendments to Rule 1110.2, they will not be considered further in this Addendum.

Flares are currently used as a means to control landfill gas at a number of affected facilities in the district. Flares are also located at facilities with biogas-fueled ICEs to combust the biogas in the event the biogas-fueled ICEs are not operating due to maintenance or breakdowns. Replacing existing biogas-fueled engines with flaring, means the biogas equipment would no longer be subject to Rule 1110.2, since Rule 1110.2 applies only to ICEs. Replacing biogas-fueled ICEs with flares was not analyzed in the 2007 Final EA because it was assumed biogas-fueled ICEs would be able to comply with the final emission concentration limits by using the new provision that allows biogas facilities to use more than 10 percent natural gas in biogas-fueled engines. Further, the technology assessment was expected to provide regulatory relief in the event that the results demonstrated that biogas-fueled ICEs could not comply with the final compliance limits.

More recently, feedback from Rule 1110.2 stakeholder working group indicated that, because of the potential difficulty that biogas-fueled engines may have in complying with the final NOx concentration requirements, operators may consider replacing affected engines with flaring biogas with existing flares, as flaring biogas is not prohibited under any existing SCAQMD regulations. The reason for this assertion is that some biogas-fueled engines are reaching the end of their useful lives and it would not make economic sense to retrofit engines that will need to be replaced within a relatively short period of time. Further, the quality of biogas (methane content) at some landfill gas facilities is declining, so it will be more difficult to combust this biogas in biogas-fueled ICEs. So, rather than retrofit existing biogas-fueled ICEs to comply with Rule 1110.2 during the period of declining biogas quality, it may be more economical to replace them with flaring. Therefore, the following analysis of potential adverse environmental impacts from adopting PAR 1110.2 focuses primarily on potential secondary adverse environmental impacts from replacing biogas-fueled engines with flaring and whether or not impacts are within the scope of the environmental analysis in the 2007 Final EA. However, all environmental topic areas from the environmental checklist (CEQA Guidelines, Appendix G) were evaluated to ensure that no potential impacts from adopting PAR 1110.2 are overlooked.

PAR 1110.2 includes an alternative compliance option for private owners/operators of biogas-fired engines with emission concentration limits in Table III-B. Under the alternative compliance option, private owners/operators of affected biogas-fired engines could elect to defer compliance with the emission limits in Table III-B by up to two years. PAR 1110.2 states that the funds collected from the compliance flexibility fee would be applied to NOx reduction programs pursuant to protocols approved under SCAQMD rules. Since all SCAQMD rules undergo

CEQA review prior to adoption any environmental impacts from NO_x reduction programs pursuant to protocols approved under SCAQMD rules have been evaluated, disclosed and mitigated if necessary. It goes without saying that any expenditure of Rule 1110.2 funds would be consistent with the CEQA analyses for the protocols approved under SCAQMD rules, so that no expenditure would be allowed if it would cause any exceedance of what was analyzed in the associated CEQA documents.

The NO_x reduction programs funded by the compliance flexibility fees under PAR 1110.2 are likely to be similar to the GHG reduction protocols under Rule 2702 – Greenhouse Gas Reduction Programs associated with combustion processes, since these GHG reduction protocols also reduce NO_x emissions. GHG reduction protocols from Rule 2702 that would also reduce NO_x emissions include:

- Boiler efficiency protocols – this protocol includes the installation of economizers or oxygen trim systems. Economizers are heat exchangers installed in flue gas ductwork between the boiler outlet and stack, which cools the flue gas. Oxygen trim systems add more precise air control based on a fuel flow sensor, electronic controller and servo-based damper positioner to reduce the amount of excess air.
- Lawn mower protocol – this protocol offers cordless electric lawn mowers to consumers at a subsidized price in exchange for old operable gasoline powered lawn mowers.
- Leaf blower protocol – this protocol offers four-stroke engine leaf blowers to professional gardeners/landscapers at a subsidized price in exchange for old operable two-stroke engine leaf blowers.
- Truck stop electrification protocol – this protocol provides funds to install external sources of heating, ventilation and air conditioning at truck stop locations. The units are attached into the side window of truck cabs at locations where trucks stop in lieu of using the truck auxiliary engines for cooling and heating. The units are powered by fixed electrification structure or trusses over truck parking spaces.

Impacts from these protocols were analyzed in the Final Program EA for Proposed Rule 2702 – Greenhouse Gas Reduction Programs (SCAQMD No. 081104MK, State Clearinghouse No., 2008111002) dated December 31, 2008, and determined not to be significant for any environmental topic. At that time the analysis assumed up to \$2.8 million per year might be spent on any one of these protocols, yet the impacts would not be significant. SCAQMD staff estimates that no more than 2.5 million per year (\$5,394,848 total over two years) would be obtained in compliance flexibility fees under Rule 1110.2. If significantly more money was obtained expenditures could be limited so that the 2.8 million per year analyzed would not be exceeded. Therefore impacts using these protocols under PAR 1110.2 would also not be significant. Since PAR 1110.2 would not result in emissions foregone or delayed, there is no need for any compliance flexibility fees submitted to the SCAQMD to achieve a particular amount of NO_x emission reductions to avoid potentially significant air quality impacts from NO_x emissions foregone or delayed. Therefore, any NO_x emission reductions and any other associated emission reduction co-benefits that would occur through applying the compliance flexibility fees to protocol programs identified in PAR 1110.2 would be solely for the benefit of environment. Therefore, together with other anticipated uses of Rule 2702 protocols, NO_x reduction programs funded by PAR 1110.2 compliance flexibility fees are expected not exceed the usage assumed in the 2008 Program EA for Rule 2702.

Aesthetics

PAR 1110.2 would include the same NOx concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NOx compliance dates to either January 1, 2016, or January 1, 2018, depending on whether the owners/operators elect and qualify for the alternative compliance option. The analysis of the currently proposed amendments concluded that aesthetics impacts would be no greater than the significant adverse aesthetic impacts identified in the 2007 Final EA. The conditions that contributed to significant adverse aesthetics impacts in Final 2007 EA would not occur with replacing existing biogas-fueled ICEs with flares for the following reasons.

Flaring biogas in lieu of complying with the 2008 amendments to Rule 1110.2 was not expected to occur and; therefore, was not fully evaluated in the 2007 Final EA. All existing biogas facilities have flares that are used to burn biogas when biogas-fueled engines are not operating. Although, initially it was assumed in the 2007 Final EA that adding new flares may further degrade the existing visual character of the facility, it was concluded that this impact would not occur because information industry representatives indicated that removing biogas-fueled ICEs and flaring biogas instead, would occur in existing flares at existing affected facilities (i.e., no new flares are expected to be built). Because the existing biogas-fueled flares have covers, no open flames are visible outside of the flares.

In addition to flares, affected digester gas facilities have emergency standby generators that can be used to support the plant during emergencies. In the event that biogas-fueled ICEs are replaced by flares, emergency standby generators would continue to operate only during emergencies. Therefore, no new emergency standby generators are expected to be necessary. However, if new emergency standby generators are installed, they are expected to be dropped into place and to look similar to the existing biogas-fueled ICEs and/or existing emergency standby generators. For these reasons, the April 20, 2007 NOP/IS for the 2007 Final EA concluded that no new aesthetics or light and glare impacts would occur. This conclusion would continue to be the case for PAR 1110.2. This situation is different compared to the circumstances that contributed to significant adverse aesthetics impacts identified in the 2007 Final EA as summarized below.

The 2007 Final EA included an evaluation of replacing existing biogas-fueled ICEs with biogas-to-LNG facilities, gas turbines, microturbines or boilers. Although turbines, microturbines and boilers are similar in physical characteristics to ICE systems, because of space issues, and location of utilities, location and quality of biogas sources, and piping; aesthetic impacts may be significant if new equipment is located near the property boundary or, in the case of biogas-to-LNG facilities, large process equipment and truck loading racks may be visible from outside of the facility. Further, if the process equipment operates at night there may be a need for additional lighting. Therefore, the 2007 Final EA determined that installation of a biogas-to-LNG facility may significantly alter the aesthetics of an existing facility.

To the extent that affected facility operators replace biogas-fueled ICEs with turbines, microturbines, and boilers, potentially significant adverse impacts would be delayed three and a half to six years depending on whether the owners/operators elect and qualify for the alternative compliance option. However, this impact was previously analyzed in the 2007 Final EA. Replacing biogas-fueled ICEs with flares, is potentially the case under PAR 1110.2, would not

create new significant adverse effects on scenic vistas; would not add new substantial damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway; would not add new substantial degradation to the existing visual character or quality of the site and its surroundings; or create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Based upon the above considerations, the proposed project would not create new aesthetics impacts or make substantially greater significant adverse aesthetics impacts identified in the 2007 Final EA. Since no new significant or substantially worse adverse aesthetics impacts were identified, no mitigation measures are necessary or required.

Agriculture and Forest Resources

PAR 1110.2 would include the same biogas NO_x concentration limits previously proposed for July 1, 2012 with effective dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. Analysis of the 2008 amendments to Rule 1110.2 in the April 20, 2007 NOP/IS concluded that the 2008 project would not generate any agricultural resources impacts. Any replacement or retrofit construction would occur at existing commercial or industrial facilities. No comments were received on the NOP/IS that refuted this conclusion, so this topic was not analyzed further in the 2007 Final EA.

Potential impacts to forestry resources were not evaluated in the 2007 Final EA because this topic was not added to the environmental checklist until the year 2010, which was after the 2007 Final EA was certified. Biogas-fueled engines are located at existing facilities, and any construction or operation is expected to occur on-site. Therefore, PAR 1110.2 is not expected to have forestry impacts. With regard to the currently proposed project, no impacts to agricultural or forestry resources are anticipated as explained below.

Flaring biogas in lieu of complying with the 2008 amendments to Rule 1110.2 was not expected to occur and; therefore, was not fully evaluated in the 2007 Final EA. However, since any biogas flaring in lieu of complying with PAR 1110.2 would occur using existing biogas-fueled flares, flaring would also occur on-site at existing facilities. PAR 1110.2 may result in the early removal of the biogas-fueled ICEs, but the similar impacts were evaluated under other equipment replacement scenarios and it was concluded in the 2007 Final EA that no impacts to agriculture would occur. This conclusion would continue to apply to the currently proposed project, even in the event that biogas-fueled ICEs are removed at a later date. The removal of the biogas-fueled engines is not expected to affect agricultural or forestry resources since the engines are placed on concrete pads on-site.

Digester gas facilities have emergency standby generators that can be used to support the plant during emergencies. Although no new emergency standby generators are expected to be needed, if existing emergency standby generators are replaced with new emergency standby generators, they are expected to be dropped in place within the boundaries of existing biogas facilities.

Therefore, based on the above information, PAR 1110.2 would not convert farmland to non-agricultural use; or conflict with existing zoning for agricultural use, or a Williamson Act contract. Therefore, it is not expected that PAR 1110.2 would conflict with existing zoning for, or cause rezoning of, forest land; or result in the loss of forest land or conversion of forest land to non-forest use. Consequently, the proposed project would not create new significant adverse

agriculture or forestry impacts or make substantially greater significant adverse impacts identified in the 2007 Final EA. Since no significant or substantially worse adverse agriculture or forestry resources impacts were identified, no mitigation measures are necessary or required.

Air Quality and Greenhouse Gas Emissions

Conflict with an Applicable Air Quality Plan

The 2007 NOP/IS concluded that the 2008 amendments to Rule 1110.2 would contribute directly to carrying out the goals of the 2007 AQMP by implementing, in part, control measure MSC-01 – Facility Modernization. Because it is expected to reduce NO_x, VOC and CO emissions from all affected source categories, which in turn, would contribute to attaining the state and federal ambient air quality standards. Thus, adopting the 2008 amendments to Rule 1110.2 was not expected to conflict or obstruct implementation of the applicable AQMP. PAR 1110.2 would not obstruct or conflict with the implementation of the AQMP because, overall, Rule 1110.2 achieves net emission reductions. The emission reductions from stationary engines fired by biogas were not included in the SIP submittal and so did not contribute to the SCAQMD's efforts to attain national ambient air quality standards. However, emission reductions resulting from PAR 1110.2 are expected to contribute to the SCAQMD's ambient air quality standards attainment efforts.

Criteria Pollutants

Summary of the Criteria Pollutant Analysis in the 2007 Final EA

To provide a worst-case analysis, the 2007 Final EA assumed that construction to install control equipment on biogas-fueled ICEs or replace existing biogas-fueled ICEs with other biogas control technologies and operation of controlled or replaced equipment would overlap in the year 2012. For non-biogas-fueled ICEs construction to install control equipment and operation of affected engines were expected to occur and overlap in the years 2008 through 2011. Therefore, potential emission impacts from PAR 1110.2 were compared to the worst-case emissions estimated for 2012 in the 2007 Final EA, the year biogas-fueled ICEs would be retrofitted with control technologies or replaced by other technologies not subject to PAR 1110.2.

The 2007 Final EA included an analysis of overlapping construction and operational criteria pollutant emissions from four worst-case scenarios: 1) the addition of after treatment on biogas-fueled ICEs, 2) the replacement of biogas-fueled ICEs with gas turbines, 3) the replacement of biogas-fueled ICEs with microturbines, 3) the replacement of biogas-fueled ICEs with gas turbines at digester gas facilities and LNG facilities at landfill gas facilities, and the replacement of biogas-fueled ICEs with microturbines at digester gas facilities. Because of space issues, it was deemed impractical for biogas-fueled facility operators to install LNG equipment at landfill gas facilities. Since impacts from the above technologies have already been analyzed, the analysis of PAR 1110.2 will focus on air quality impacts associated with replacing biogas-fueled ICEs with existing flares.

Construction Impacts

All facilities that operate biogas-fueled ICEs also have existing flares that are operated when the biogas-fueled ICEs are not operating either in emergency situations or when biogas-fueled ICEs are offline for maintenance. Since biogas facilities have existing flares that can be used to flare all biogas from the facilities during emergencies or maintenance, replacing existing biogas-fueled ICEs with flares would not require new flares to be installed because of PAR 1110.2.

Facility operators may remove existing ICEs before the end of their useful operating life to avoid costs associated with replacing engines that would only operate a few years until the existing replacement flares begin operating full time. If operators choose to replace biogas-fueled engines with flares before the end of their useful life, potential demolition air quality impacts, would likely occur earlier, but no new adverse demolition air quality impacts are expected, they would simply occur sooner. In addition, demolition of existing biogas-fueled engines would be no greater than the worst-case construction air quality impacts evaluated in the 2007 Final EA, which was removing an entire existing biogas-fueled engine system and installing a LNG plant.

The 2007 Final EA assumed that emergency backup engines would be installed at digester gas facilities that replaced existing biogas-fueled engines with alternative technologies that do not generate electricity. Subsequent to the adoption of the 2008 amendments, it was determined that all digester facilities already have existing diesel emergency engines for the same reasons they have flares, i.e., when the biogas-fueled ICEs are not operating either in emergency situations or when biogas-fueled ICEs are offline for maintenance. To be conservative, the 2007 Final EA evaluated construction emissions from replacing existing diesel emergency standby engines with new diesel emergency standby engines are included in the analysis of overlapping construction and operation air quality impacts. Construction emissions only from replacing existing diesel emergency standby engines with new diesel emergency standby engines are presented in Table 2.

**Table 2
Secondary Construction Criteria Pollutant Emissions Potentially Associated with Flaring Operations in Lieu of Complying with PAR 1110.2**

Description	NO _x , lb/day	CO, lb/day	VOC, lb/day	SO _x , lb/day	PM ₁₀ , lb/day	PM _{2.5} , lb/day
Construction Emissions from Installing Emergency Standby Engines ^a	53	22	6.4	0.02	2.7	2.7

a) Source: Table 4-34 – Criteria Construction Emissions for Biogas and Non-biogas Facilities from Installing SCR, Gas Turbines or Microturbines at All Biogas Facilities of the 2007 Final EA, year 2012. It was assumed that construction emissions from installing control equipment were equivalent to installing a new emergency standby engine.

Operational Impacts

Direct Air Quality Impacts from Flaring

Flaring biogas in lieu of complying with PAR 1110.2 was not evaluated in the 2007 Final EA. Any flaring of biogas in lieu of complying with PAR 1110.2 would occur in existing flares and would displace combustion in biogas-fueled ICEs. Flaring biogas would generate criteria pollutant emissions from the combustion of the biogas in the flares rather than in the biogas-fueled ICEs. Direct criteria pollutant emissions from daily flaring are presented in Table 3. The direct flare emissions shown in Table 3 were derived using the same biogas emissions usage rates that were used to quantify direct emission from biogas-fueled ICEs complying with the concentration limits in the 2008 amendments to Rule 1110.2 and analyzed in the 2007 Final EA. NO_x, CO and VOC emissions were estimated using emission factors developed from source test results. SO_x emissions from flares would be the same as those from ICEs because SO_x is generated by the sulfur content of the fuel, which would be the same regardless of combustion

equipment. Based on source tests, the PM emissions from flares would be the similar to those from ICEs.

**Table 3
Criteria Pollutant Emissions Generated by Flaring Operations
in Lieu of Complying with PAR 1110.2**

Description	NO _x , lb/day	CO, lb/day	VOC, lb/day	SO _x , lb/day	PM10, lb/day	PM2.5, lb/day
Direct Emissions from Flaring Biogas ^a	683	1,402	427	464	136	136
Emissions from Additional Electricity Generation ^b		431	35		45	45
Secondary Emergency Standby Engines ^c	42	114	12	0.42	3.6	3.6
Total Emissions from Flaring Operations	725	1,947	474	464	185	185

- a) Direct emissions from flaring biogas are total daily flare emissions and do not take into consideration baseline combustion emissions.
- b) Source: Table 4-15 of the 2007 Final EA for PAR 1110.2.
- c) Source: Table 4-19 of the 2007 Final EA for PAR 1110.2

Secondary Air Quality Impacts from Flaring

Biogas-fueled ICEs are typically used to generate electricity for onsite equipment and may sell any excess electricity to the electricity grid. In addition to backup flares all facilities that operate biogas-fueled ICEs also operate emergency backup generators to produce electricity in the event that the biogas-fueled ICEs are not operating due to emergencies or maintenance. In such situations, the emergency backup generators would need to operate to continue supplying electricity to onsite equipment.

If all of the biogas is flared instead of being combusted in the biogas-fueled ICEs, then the facility would need electricity from the grid to power operations currently powered by the existing biogas-fueled ICEs. The electricity needed at a facility that replaces biogas-fueled ICEs with flares would only need to be equivalent to the amount formerly generated by the existing ICEs. However, as demonstrated in the 2007 Final EA, replacing biogas-fueled ICEs with LNG plants would require additional energy from the grid, not only to operate existing onsite equipment, but to operate the new LNG plant. Table 3 presents the estimated criteria pollutant emissions from the 2007 Final EA for power plants generating electricity necessary to operate equipment at biogas facilities that replace biogas-fueled ICEs with flares.

In addition to quantifying emission for facilities that replace biogas ICEs with alternative technologies that do not generate electricity in lieu of complying with PAR 1110.2, the 2007 Final EA also analyzed emissions from emergency standby diesel engines. Although, SCAQMD staff has determined that digester gas facilities already have existing diesel emergency standby engines, to provide a conservative analysis it was assumed that facility operators who flare biogas in lieu of complying with PAR 1110.2 would also install new diesel emergency standby engines. Table 3 presents the criteria emissions from diesel fueled emergency standby engines from the 2007 Final EA for biogas facilities.

Total Criteria Emission Impacts from Flaring

2007 Final EA and Proposed Project Baselines

The emission estimates in the 2008 Final Staff Report and 2007 Final EA for the baseline and the project were based on a combination of rule limits, and source test values, which were lower than the emission limits in the existing and proposed project versions of Rule 1110.2. During the current rule making for this proposed project, emissions estimated in the Staff Report were based on the existing Rule 1110.2 and PAR 1110.2 emission limits. The baselines from the 2007 Final EA and the proposed project are presented in Table 4. Because the 2007 Final EA emission estimates for baseline include source test emissions (closer to actual emissions), they are lower than those estimated for the proposed project in the Staff Report for PAR 1110.2 (potential emissions), the baseline emissions estimate in the 2007 Final EA would result in fewer emission reductions (emission reductions are estimated by subtracting the project emissions from the baseline), which is conservative. Therefore, the 2007 Final EA emission baseline was used for this analysis.

**Table 4
2007 Final EA and Baseline and Baseline Based on Existing Rule 1110.2 Emission Limits**

Description	NO _x , lb/day	CO, lb/day	VOC, lb/day
2007 Final EA (Source Test and Emission Limits)	1,859	9,555	882
Existing Rule 1110.2 Limits Only	2,600	51,200	1,600

Criteria Pollutants from Flaring Operations in Lieu of Complying with PAR 1110.2

The total criteria pollutant emissions from flaring operations (including secondary emissions) are presented in Table 5. The total criteria pollutant emissions include both construction and operational emissions, since it is possible that construction and operation could overlap.

**Table 5
Evaluation of Criteria Emissions Generated by Flaring Operations
in Lieu of Complying with PAR 1110.2**

Description	NO _x , lb/day	CO, lb/day	VOC, lb/day	SO _x , lb/day	PM ₁₀ , lb/day	PM _{2.5} , lb/day
Biogas Baseline Emissions ^a	1,859	9,555	882	464	136	136
Flare Related Construction Emissions ^b	53	22	6.4	0.02	2.7	2.7
Flare Related Operational Emissions ^c	725	1,947	474	464	185	185
Difference in Emissions ^d	(1,081)	(7,586)	(402)	0.02	52	52
Significance Threshold	55	550	55	150	150	55
Significant?	No	No	No	No	No	No

a) Biogas-fueled engine baseline from Table 3. 2007 Final EA biogas-fueled engine baseline.

b) Flare – construction criteria emissions from Table from Table 2

c) Flare – operational criteria emissions from Table from Table 3.

d) Difference in emissions = biogas baseline emissions – (flare related construction emissions + flare related operational emissions.)

Numbers in parentheses represent emission reductions.

Emissions from flaring in lieu of complying with PAR 1110.2 are compared to existing emission from biogas-fueled ICEs in Table 5. The difference between criteria pollutant emission generated by flaring operations in lieu of complying with PAR 1110.2 and existing biogas-fueled ICEs were compared to the operational significance thresholds since construction and operations may overlap to be conservative (i.e., since operational significance thresholds are more stringent than construction significance thresholds). Flaring operations in lieu of complying with PAR 1110.2 would generate lower NO_x, CO and VOC emissions than the existing biogas-fueled engines (i.e., NO_x, CO and VOC emission reductions). SO_x (0.02 pounds per day), PM₁₀ (52 pounds per day) and PM_{2.5} (52 pound per day) emissions would be greater than those generated by existing biogas-fueled ICEs because of secondary emissions, but would not exceed the significant thresholds for SO_x (150 pounds per day), PM₁₀ (150 pounds per day) or PM_{2.5} (55 pounds per day).

Toxic Air Contaminants

The flaring of biogas in lieu of complying with PAR 1110.2 was not examined in the 2007 Final EA. The flaring of biogas currently occurs at biogas facilities when biogas-fueled ICEs are not operating because of emergencies or for maintenance. Biogas-fueled engines and flares are tested at the inlet and outlet for Rule 1150.1 Table 1 and Table 2 compounds. Based on a review of Rule 1150.1 flares typically have greater destruction efficiency than biogas-fueled ICEs. Therefore, biogas flaring in lieu of complying with PAR 1110.2 would result in potentially lower toxic air contaminant (TAC) emissions.

The 2007 Final EA estimated that the worst-case carcinogenic health risk would occur if biogas-fueled ICEs are replaced with alternative technologies in lieu of complying with PAR 1110.2. Although affected facility operators who replace biogas-fueled ICEs with alternative technologies may also need to install emergency standby diesel engines to power the facility when the alternative technology is not operating, the 2007 Final EA indicated that biogas facilities already have existing diesel emergency standby generators that are only operated periodically to ensure operability. Taking a conservative approach it was estimated that the diesel emergency standby generators would be installed at affected facilities and could potentially generate a carcinogenic health risk of 3.4 in one million, which is less than the SCAQMD's cancer risk significance threshold of 10 in one million. Because affected facilities already have emergency standby diesel engines, the 3.4 in one million is considered to be a conservative estimate.

In the 2007 Final EA the worst-case cancer risk impacts analyzed would occur if affected biogas facility operators that have both biogas-fueled and natural gas-fueled non-biogas-fueled ICEs onsite and replaced them with electric motors and emergency standby diesel engines. The worst-case carcinogenic health risk replacing a natural gas-fueled non-biogas-fueled ICEs with electric motors and diesel emergency backup generators was calculated to be 18 in one million. This risk, when added to the risk of replacing an existing emergency standby diesel engine with a new engine, produced an estimated cancer risk of 21.4 in one million (3.4 in one million + 18 in one million). Therefore, the worst-case health risk of 21.4 in one million, which was determined to be significant in the 2007 Final EA, is substantially greater than the potential cancer risk of replacing existing biogas-fueled ICEs with flares.

Since PAR 1110.2 would not generate any new TAC emissions beyond what was already evaluated in the 2007 Final EA, PAR 1110.2 is expected to be less than significant for adverse TAC emission impacts and well within the scope of the cancer risk analysis in the 2007 Final EA.

Cumulatively Considerable Impacts

Since new adverse air quality impacts from implementing PAR 1110.2 are not expected to exceed any project-specific air quality significance thresholds, air quality impacts are not expected to be cumulatively considerable as defined in CEQA Guidelines §15064(h)(1).

Odor Impacts

The 2007 Final EA examined potential odor impacts from ammonia slip related to SCR units, diesel exhaust odor from additional diesel truck trips and from emergency standby diesel ICEs related to alternative technologies used in lieu of biogas-fueled ICEs. However, the odor impacts analysis in the 2007 Final EA concluded that there would be no significant adverse odor impacts.

The 2007 Final EA did not specifically evaluate potential odor impacts from replacing existing biogas-fueled ICEs with flares. Since the primary effect of adopting PAR 1110.2 is assumed to be replacement of biogas-fueled ICEs with flares, less than significant odor impacts from replacing biogas-fueled ICEs with other technologies or install control equipment evaluated in the 2007 Final EA would be unchanged. Further, replacing biogas-fueled ICEs with flares does not involve the use of ammonia and is not expected to affect operations or change the number of truck trips visiting affected facilities.

This analysis also assumed that those facility operators who replace biogas-fueled ICEs with flares would also install new emergency standby diesel engines as backups to provided electricity in the event of power outages. Emergency standby diesel engines are limited to 50 hours of operation per year for testing. Testing events typically don't last more than 30 minutes and usually no more frequently than once per week. Because of this limitation no odor impacts are expected.

For the above reasons PAR 1110.2 is not expected to generate significant adverse odor impacts or make an existing adverse impact substantially worse from replacing biogas-fueled ICEs with flares.

Greenhouse Gas Impacts

Global warming is the observed increase in average temperature of the earth's surface and atmosphere. The primary cause of global warming is an increase of greenhouse gas (GHG) emissions in the atmosphere. The six major types of GHG emissions are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), haloalkanes (HFCs), and perfluorocarbons (PFCs). The GHG emissions absorb longwave radiant energy emitted by the earth, which warms the atmosphere. The GHGs also emit longwave radiation both upward to space and back down toward the surface of the earth. The downward part of this longwave radiation emitted by the atmosphere is known as the "greenhouse effect."

The current scientific consensus is that the majority of the observed warming over the last 50 years can be attributable to increased concentration of GHG emissions in the atmosphere due to human activities. Events and activities, such as the industrial revolution and the increased

consumption of fossil fuels (e.g., combustion of gasoline, diesel, coal, etc.), have heavily contributed to the increase in atmospheric levels of GHG emissions. As reported by the California Energy Commission (CEC), California contributes 1.4 percent of the global and 6.2 percent of the national GHG emissions (CEC, 2004). Further, approximately 80 percent of GHG emissions in California are from fossil fuel combustion (e.g., gasoline, diesel, coal, etc.).

The 2007 Final EA estimated GHG emissions from construction and operation assuming both full compliance with the 2008 amendments (i.e., without any electrification) and compliance with the 2008 amendments. The 2007 Final EA first evaluated cost estimates for replacing existing ICEs with electric motors in certain applications instead of incurring the costs of installing emissions controls and monitoring and inspection and maintenance (I&M) equipment that would be necessary to comply with PAR 1110.2. SCAQMD staff identified 225 nonbiogas engines where operators would incur lower compliance costs if they replaced them with electric motors and assumed that 75 percent of these engines (169) would voluntarily be replaced with electric motors. The analysis indicated that replacing all 169 nonbiogas engines with electric had the potential of reducing GHG emissions by 107,276 metric tons per year⁴. Further, the analysis also determined that if at least 15 ICEs were replaced with electric motors, there would be no additional GHG emissions generated by the 2008 amendments to Rule 1110.2. It was assumed that at least 15 of the 169 non-biogas-fueled ICEs would be replaced, so the 2008 amendments to Rule 1110.2 analyzed in the 2007 Final EA were assumed to be less than significant for GHG emissions. PAR 1110.2 is not expected to affect in any way replacement of nonbiogas engines with electric motors because the proposed amends only affect biogas-fueled ICEs.

Since GHG emissions are based on fuel usage, the GHG emissions from flaring biogas would be the same as combusting biogas in an ICE. Based on the analysis for the 2007 Final EA approximately 115.5 metric tons of CO₂ per year would be generated by power plants to support a facility that no longer generated electricity from biogas. The analysis also estimated that emergency standby engines would generate 307 metric tons of CO₂. Therefore, replacing existing biogas-fueled ICEs with flares would be expected to generate GHG emission of approximately 423 metric tons per CO₂ would be generated, which is essentially the same as replacing existing biogas-fueled ICEs with other types of technologies and less than the SCAQMD significance threshold of 10,000 metric tons per year. Consequently, GHG emission impacts from PAR 1110.2 are within the scope of the analysis of GHG impacts in the 2007 Final EA.

Therefore, the proposed project would not substantially alter the conclusion in the 2007 Final EA that GHG significant adverse air quality impacts are not anticipated and, therefore, will not be further analyzed. Since no new significant adverse air quality impacts were identified, no mitigation measures are necessary or required.

Based upon these considerations, the proposed project would not make substantially worse any significant adverse air quality or GHG impacts detailed in the 2007 Final EA, significant adverse air quality or GHG emission impacts are not anticipated and, therefore, an addendum is the appropriate. Since no significant or substantially worse adverse air quality or GHG emission impacts were identified, no mitigation measures are necessary or required.

⁴ Does not include indirect GHG emissions from power plants or emergency engines.

Biological Resources

PAR 1110.2 includes the same NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates to January 1, 2016 or January 1, 2018 under the alternative compliance option. The analysis of biological impacts from PAR 1110.2 would be same as those identified for the 2008 amendments to Rule 1110.2, which were not deemed significant in the 2007 Final EA. As stated in the 2007 Final EA all construction and operational impacts would occur on existing facilities. Any impacts to biological resources would only occur at a later date.

The flaring of biogas in lieu of complying with PAR 1110.2 was not evaluated in the 2007 Final EA. Any flaring of biogas in lieu of complying with PAR 1110.2 would occur at existing affected facilities using existing onsite flares. For fire safety reasons, the area around biogas-fueled flares is devoid of biological activity. Affected operators that flare biogas in lieu of complying with PAR 1110.2 may remove biogas-fueled ICEs. PAR 1110.2 may result in the early removal of the biogas-fueled engines, but the impacts would be the same as removing them at a later date. The removal of the biogas-fueled engines is not expected to affect biological resources since the engines are placed on concrete pads and the area around the ICEs would be void of biological activity for fire safety reasons.

Existing digester gas facilities have emergency standby generators that can be used to support the plant during emergencies if the biogas-fueled engines are replaced by flares. Landfill gas facilities typically do not use emergency standby generators. The 2007 Final EA assumed that emergency engines would be installed at digester gas facilities that replaced their ICEs with alternative technologies in lieu of complying with the existing rule. If emergency engines are installed at an affected facility, the impacts would be no greater than those analyzed in the April 20, 2007 NOP/IS for the 2007 Final EA. Therefore, no new impacts are expected to biological resources from emergency standby generators. The removal of the biogas-fueled engines is not expected to affect biological resources since the engines would be placed on existing concrete surfaces within the boundaries of existing biogas facilities and the area around the emergency standby generators would be void of biological activity for fire safety reasons.

As explained above, PAR 1110.2 would not create a new significant adverse effect or make an existing adverse impact substantially worse, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service; have a new substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service; have a new substantial adverse effect on federally protected wetlands as defined by §404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Based upon these considerations, the proposed project would not make substantially worse any significant adverse biological resource impacts detailed in the 2007 Final EA, significant adverse biological resources impacts are not anticipated and, therefore, an addendum is the appropriate. Since no significant or substantially worse adverse adverse biological resources impacts were identified, no mitigation measures are necessary or required.

Cultural Resources

PAR 1110.2 includes the same biogas concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NOx compliance dates to January 1, 2016 or January 1, 2018 under the alternative compliance option. The analysis of cultural impacts from PAR 1110.2 would be the same as identified for the 2008 amendments to Rule 1110.2, which were not deemed significant for adverse cultural impacts in the April 20, 2007 NOP/IS for the 2007 Final EA. Any impacts to cultural resources would only occur at a later date.

The flaring of biogas in lieu of complying with PAR 1110.2 was not evaluated in the 2007 Final EA. All biogas flaring in lieu of complying with PAR 1110.2 would occur at existing affected facilities using existing biogas-fueled flares. If an operator flares biogas in lieu of complying with PAR 1110.2, they may also choose to remove the existing biogas-fueled ICEs. PAR 1110.2 may result in the early removal of the biogas-fueled engines, but the impacts would be the same as removing them at a later date. Demolition of biogas-fueled ICEs, is not expected to affect cultural resources, since the area around the biogas-fueled ICEs would have been previously disturbed (area graded, concrete slabs laid and ICEs and support equipment installed) to install the ICEs.

Existing digester gas facilities have emergency standby generators that can be used to support the plant during emergencies, if the biogas-fueled engines are replaced by flares. Landfill gas facilities typically do not use emergency standby generators. The 2007 Final EA assumed that emergency engines would be installed at digester gas facilities that replaced their ICEs with alternative technologies in lieu of complying with the existing rule. If emergency engines are installed at an affected facility, the impacts would be no greater than those analyzed in the 2007 Final EA. If new emergency standby generators are needed they are expected to be dropped in place within the boundaries of existing biogas facilities. Therefore, no new impacts are expected to cultural resources from emergency standby generators.

As explained above, PAR 1110.2 would not create a new significant adverse change in the significance of a historical resource as defined in §15064.5; cause a new substantial adverse change in the significance of an archaeological resource as defined in §15064.5; directly or indirectly destroy a unique paleontological resource, site, or feature; disturb any human including those interred outside formal cemeteries.

Based upon these considerations, the proposed project would not make substantially worse any significant adverse cultural resource impacts detailed in the 2007 Final EA, significant adverse cultural resources impacts are not expected from implementing PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse adverse cultural resources impacts were identified, no mitigation measures are necessary or required.

Energy Impacts

PAR 1110.2 would include the same biogas NO_x concentration limits previously proposed for July 1, 2012 with effective dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. As a result, potential adverse energy impacts associated with compliance options for biogas-fueled ICEs would be same as impacts analyzed for the 2008 proposed amendments to Rule 1110.2 in the 2007 Final EA, but energy impacts, which were deemed less than significant would be expected to occur at a later date.

Electricity Impacts

The use of after treatment on ICEs was assumed to reduce efficiency of some ICEs due to pressure drops caused by the control devices. The 2007 Final EA concluded that this would result in a minor loss of electricity production (1,706 megawatt hours per year).

Alternative technologies used in lieu of complying with PAR 1110.2 (boilers, turbines and microturbines) generate more waste heat than ICEs, which reduces the amount of electricity produced. Replacing biogas-fueled ICEs with microturbines alone was determined to result in the greatest loss of electricity production (101,013 megawatt hours per year). The analysis in the 2007 Final EA assumed if an operator replaced ICEs with either a gas turbine and LNG plant or a microturbine and an LNG Plant, all electricity production would be lost and additional electricity from the power grid would be required to operate the LNG plant. The scenario where ICEs are replaced with microturbines at digester gas facilities and LNG plants at landfill gas facilities was estimated to result in a loss in electricity production and increased demand for electricity to operate the LNG plant of 404,133 megawatt hours per year. Adding the electricity production loss from replacing biogas-fueled ICEs with LNG plants to the electricity production loss from replacing non-biogas engines with electric motors (171,827 megawatt hours per year), the 2007 Final EA estimated that the worst-case electrical energy production loss would be 576,527 megawatt hours per year. However, a 576,527 megawatt hour per year loss was not deemed significant because it would be less than one percent of the 120,194 gigawatt hours per year available in southern California reported in the Final Program EIR for the 2007 AQMP.

Flaring biogas in lieu of complying with PAR 1110.2 was not evaluated in the 2007 Final EA because it was assumed that most operators would not choose to flare biogas, since electricity or heat generated by biogas-fueled ICEs is typically used to power operations onsite or, if electricity is produced in excess of onsite needs, sold to local utilities to be used offsite. Flaring of biogas in lieu of complying with PAR 1110.2 would likely occur at facilities where the quality of the biogas is poor (e.g., closed landfills) and/or the existing ICEs are at the end of their useful life, since it may not be cost effective to install after treatment or replacement engines with alternative technologies (biogas turbines, microturbines, biogas to LNG plants) once biogas concentrations become poor. Biogas flares would still be required as a safety measure at landfills with poor biogas concentrations.

If all biogas-fueled ICEs are replaced by flares, according to the 2007 Final EA, approximately 437,214 megawatt hours per year of energy production would be lost. The electricity loss from non-biogas-fueled ICEs identified in the 2007 Final EA was 171,827 megawatt hours per year, which would not be affected by PAR 1110.2. Therefore, the total loss of electricity from the non-biogas-fueled ICE requirements 2008 amendments to Rule 1110.2 and the current PAR 1110.2 if all biogas were flared would be 609,041 megawatt hours per year. This too would be less than one percent (0.5 percent) of the 120,194 gigawatt hours per year available in southern

California reported in the Final Program EIR for the 2007 AQMP. Therefore, if all biogas at closed landfills was flared in lieu of complying with the biogas portion of PAR 1110.2, energy impacts from implementing PAR 1110.2 would remain not significant.

Natural Gas Impacts

It was concluded in the 2007 Final EA that the 2008 amendments to Rule 1110.2 would result in a reduction of natural gas use because of the electrification of some of the non-biogas-fueled engines in lieu of complying with the amendments. If an operator uses the efficiency correction factor the amount of natural gas used in biogas-fueled engines would be restricted to 10 percent of the gas consumed in the existing ICEs. Once the biogas concentration limits become effective, there would be no limit on the percentage of natural gas burned in the 2008 amendments to Rule 1110.2. The proposed project would continue to allow the percentage of natural gas in the combustion fuel to be unrestricted once an affected ICE complies with the concentration limits of PAR 1110.2. Therefore, PAR 1110.2 is not expected to change the conclusion of no significant adverse natural gas impacts.

Flaring biogas in lieu of complying with PAR 1110.2 was not evaluated in the 2007 Final EA. Any biogas flaring in lieu of affected engines complying with PAR 1110.2 would occur in existing biogas-fueled flares. Since flaring would occur in existing biogas-fueled flares (all affected facilities have backup flares in the event of a shutdown of the affected engine), and flares can burn lower quality biogas than ICEs, flaring biogas in lieu of complying with PAR 1110.2 is likely to result in less natural gas use.

If the biogas-fueled engines are replaced by flares, digester gas facilities have emergency standby generators that can be used to support the plant during emergencies. Landfill gas facilities typically do not use emergency standby generators. Therefore, no new emergency standby generators are expected. However, if new emergency standby generators are needed they are expected to be dropped in place within the boundaries of existing biogas facilities. The 2007 Final EA estimated that approximately 5,023 million btu per year (0.013 million cubic feet per day) may be required at a single facility to fuel new emergency standby generators. The 2007 Final EA for the AQMP states that 1,474 million cubic feet of natural per day is used in the industrial sector in California. The consumption of 0.013 million cubic feet per day would be less than one percent (0.0009 percent) of the California industrial daily consumption, which is not considered significant.

Diesel Fuel Impacts

Additional diesel fuel was expected to be consumed during construction; from trips related to source testing, delivery, or hauling away of spent carbon or catalysts; and by diesel emergency generators depending on whether operators would comply with PAR 1110.2 or replace existing biogas-fueled ICEs with an alternative technology. It was determined in the 2007 Final EA that the maximum 3,218 gallons of diesel that may be consumed per day would be less than one percent (0.02 percent) of the 10 million gallons of diesel used in California and, therefore, was not considered to be significant.

The flaring of biogas in lieu of complying with PAR 1110.2 was not evaluated in the 2007 Final EA. All biogas flaring in lieu of complying with PAR 1110.2 would occur in existing biogas-fueled flares. In spite of the delay in emission limits for biogas fueled PAR 1110.2 may result in the early removal of biogas-fueled ICEs, if operators choose to flare biogas in lieu of complying

with PAR 1110.2. However, the removal of ICEs was included in the diesel fuel construction estimate in the 2007 Final EA, which determined diesel fuel impacts not to be significant. Existing digester facilities are expected to have emergency generators that can operate essential services at the facilities during emergencies. Landfill gas facilities do not use emergency generators. Therefore, no additional diesel is expected to be used. However, the use of diesel fuel (202 gallons per day) if facilities had to install new diesel emergency engines was evaluated in the 2007 Final EA, which determined diesel fuel impacts not to be significant.

Renewable Resource Impacts

Biogas is considered a renewable energy resource. Currently biogas-fueled ICEs generate electricity that is either used at the biogas facilities, sold to the electricity grid, or some combination of the two.

In-state renewable electricity generation (30,005 GWh) in California is 14.6 percent of the total electricity generated (205,018 GWh) in 2010.⁵ In-state electricity from biomass (5,745 GWh) represents about 17 percent of the total renewable electricity capacity (30,005 GWh) in California. Of this 17 percent, approximately 32 percent of electricity produced from biopower is produced from the combustion of landfill (28 percent) and digester gas (four percent).⁶ Senate Bill 1078 (SB 1078, Sher, Chapter 516, Statutes of 2002) established the California Renewables Portfolio Standard (RPS) program, which requires an annual increase in renewable generation by the utilities equivalent to at least one percent of sales, with an aggregate goal of 20 percent by 2017. In 2006, this target date was accelerated to 2010, and in 2011 the RPS was revised to require that renewable electricity should equal an average of 20 percent of the total electricity sold to retail customers in California during the compliance period ending December 31, 2013, 25 percent by December 31, 2016, and 33 percent by December 31, 2020.

It is assumed for this analysis that operators of biogas-fueled ICEs would flare biogas in lieu of complying with PAR 1110.2. The quality of landfill gas decreases after landfills close. In the long term operators of biogas-fueled ICEs at closed landfills may need to flare biogas instead of installing after treatment on existing biogas-fueled ICEs or replacing the ICEs with alternative technologies because the quality of the landfill gas (methane content) declines to the point where biogas-fueled ICEs cannot combust the landfill gas to provide electricity, whereas flares would still be able to combust the landfill gas at low methane content levels. Since it is likely that biogas-fueled ICEs at closed landfills would eventually be replaced with flares anyway when the landfill gas quality becomes poor, PAR 1110.2 may only result in an earlier transition from burning biogas in engines to burning biogas in flares.

Based on a conversation with CEC staff,⁷ SCAQMD staff used the California Biomass Collective's biomass facility database to estimate the gross capacity in megawatts of ICEs at closed landfills. Based on closure information in the CalRecycle Solid Waste Information System⁸ and capacity data in biomass facility database approximately 29.9 megawatts of

⁵ CEC, Energy Almanac, Total Electricity System Power, 2010 Total System Power in Gigawatt Hours http://energyalmanac.ca.gov/electricity/total_system_power.html

⁶ CEC, Table 2-3: Summary of In-State Biopower Capacity, 2011 Bioenergy Action Plan, CEC-300-2011-001-CTF, March 2011, <http://www.energy.ca.gov/2011publications/CEC-300-2011-001/CEC-300-2011-001-CTF.PDF>

⁷ Conversation with Mr. Prab Sethi of the CEC on March 14, 2012.

⁸ CalRecycle, Solid Waste Information System, <http://www.calrecycle.ca.gov/SWFacilities/Directory/>, March 14, 2012

capacity⁹ is available at closed landfills in the district. The 2011 Bioenergy Action Plan estimates that there was 1,528 megawatts of bioenergy capacity in 2010 with another 1,311 megawatts in proposed projects for a total of 2,839 megawatts of capacity by the end of 2012. The 29.9 megawatts of capacity at closed biogas facilities would be less than one percent (0.5 percent) of the 2,839 megawatts of bioenergy expected by the end of 2012. It is conservative to assume that capacity at all closed biogas facilities would be lost because of flaring in lieu of complying with PAR 1110.2. Based on the CEC’s December 2011 Lead Commissioner Report – Renewable Power in California: Status and Issues,¹⁰ new photovoltaic, solar thermal and wind projects are expected to generate most of the renewable energy in California (see Table 6). Therefore, based on the above analysis, the amount of renewable energy lost because of operators flaring biogas in lieu of complying with PAR 1110.2 is not expected to generate a significant adverse impact or make substantially worse a significant adverse impact to renewable energy.

**Table 6
Renewable Projects Permitted in 2010 by California County (in Megawatts)**

County	Bio	Cogen	Geo	Photo-voltaic >20MW	Photo-voltaic <20MW	Solar Thermal	Photo-voltaic/ Solar Thermal	Wind	Total
Imperial			208	1,259					1,467
Kern	44			867	24	250		2,169	3,354
Kings				145					145
Los Angeles		85		337					422
Riverside				175		1,734			1,909
Sacramento					2				2
San Bernardino				20		770	633		1,423
San Diego				45					45
San Luis Obispo				250					250
Shasta								102	102
Solano								155	155
Stanislaus				50	1				51
Tulare				110					110
Total	44	85	208	3,258	27	2,754	633	2,426	9,435

Source: CEC, Lead Commissioner Report – Renewable Power in California: Status and Issues, CEC-150-2011-002-LCF-REV1, December 2011.

As explained above, the PAR 1110.2 would not conflict with adopted energy conservation plans; result in the need for new or substantially altered power or natural gas utility systems; create any significant effects on local or regional energy supplies and on requirements for additional energy; create any significant effects on local or regional energy supplies and on requirements

⁹ California Biomass Collective’s biomass facility database , <http://biomass.ucdavis.edu/tools/>, March 14, 2012,

¹⁰ CEC, Lead Commissioner Report – Renewable Power in California: Status and Issues, CEC-150-2011-002-LCF-REV1, December 2011

for additional energy; create any significant effects on peak and base period demands for electricity and other forms of energy; and would comply with existing energy standards.

Based upon these considerations, the proposed project would not substantially alter the significant adverse energy impacts detailed in the 2007 Final EA; significant adverse impacts to energy are not expected from implementation of PAR 1110.2. Since PAR 1110.2 would not generate any new significant energy impacts or make substantially worse any significant adverse impacts, an addendum is appropriate. Since no significant or substantially worse adverse energy impacts were identified, no mitigation measures are necessary or required.

Geology and Soils

PAR 1110.2 includes the same biogas concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates to January 1, 2016 or January 1, 2018 under the alternative compliance option. The analysis of geology and soils impacts would be the same as proposed in the 2008 amendments to Rule 1110.2, which were not deemed significant for adverse geology and soils impacts in the April 20, 2007 NOP/IS for the 2007 Final EA. Any impacts to geology and soils would only occur at a later date.

Flaring biogas in lieu of complying with PAR 1110.2 was not analyzed in the 2007 Final EA. However, any flaring of biogas in lieu of complying with PAR 1110.2 would occur at existing affected facilities using existing biogas-fueled flares. Therefore, no construction would be required. Affected operators that flare biogas in lieu of complying with PAR 1110.2 may remove biogas-fueled ICEs. PAR 1110.2 may result in the early removal of the biogas-fueled engines, but the impacts would be the same as removing them at a later date. The removal of the biogas-fueled engines is not expected to affect geology and soils since the engines are placed on concrete pads.

Existing digester gas facilities have emergency standby generators that can be used to support the plant during emergencies, if the biogas-fueled engines are replaced by flares. Landfill gas facilities typically do not use emergency standby generators. The 2007 Final EA assumed that emergency engines would be installed at digester gas facilities that replaced their ICEs with alternative technologies in lieu of complying with the existing rule. If emergency engines are installed at an affected facility, the impacts would be no greater than those analyzed in the 2007 Final EA. Therefore, no new impacts are expected to geological resources from emergency standby generators. However, if new emergency standby generators are needed they are expected to be dropped in place on existing concrete surfaces within the boundaries of existing biogas facilities.

As explained above, the PAR 1110.2 would not expose people or structures to potential new significant adverse effects, including the risk of loss, injury, or death involving ruptures of a known earthquake fault, strong seismic ground shaking or seismic-related ground failure, including liquefaction; result in new substantial soil erosion or the loss of topsoil; be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in new on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse; be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or have soils incapable of adequately

supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Based upon these considerations, since the proposed project is not expected to adversely affect geology or soils in any way, it would not alter the significant adverse geology and soil impacts conclusion in the 2007 Final EA. Since no significant or substantially worse adverse geology and soils impacts were identified, no mitigation measures are necessary or required.

Hazards and Hazardous Materials

PAR 1110.2 includes the same biogas concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates to January 1, 2016 or January 1, 2018 under the alternative compliance option. The analysis of hazards and hazardous material impacts would be the same as proposed in the 2008 amendments to Rule 1110.2, which were not deemed significant for hazards and hazardous material impacts in the 2007 Final EA. Any hazards or hazardous materials impacts would only occur at a later date.

Additional diesel fuel was expected to be consumed during construction; from trips related to source testing, delivery, or hauling away of spent carbon or catalysts; and by diesel emergency generators depending on whether operators would comply with 2008 amendments to Rule 1110.2 or replace existing biogas-fueled ICEs with an alternative technology. The 2007 Final EA concluded that hazard impacts associated with additional diesel use would not be significant. Flaring in lieu of complying with PAR 1110.2 would eliminate the need for diesel during construction and trips related to source testing, delivery, or hauling away of spent carbon or catalysts. As a result, potential hazards associated with diesel used as a mobile source fuel would be less under PAR 1110.2 than was analyzed in the 2007 Final EA.

Similarly, potential hazard impacts from biogas-fueled ICEs that would have complied with 2008 amendments to Rule 1110.2 using SCR units using either aqueous ammonia or urea to operate would be eliminated under the proposed project. Delivery of ammonia for SCR units would no longer be necessary. The 2007 Final EA concluded that a catastrophic release of ammonia from storage tanks could result in significant adverse exposures to ammonia vapors. If flaring of biogas is chosen in lieu of complying with PAR 1110.2, no ammonia would be used. Therefore, hazard impacts from ammonia handling, storage or transportation would be less under PAR 1110.2 than was analyzed in the 2007 Final EA.

In the 2007 Final EA, SCAQMD staff concluded that a cataclysmic destruction of an LNG storage tank in an LNG facility system would extend 0.2 mile from the LNG storage tank, which was considered to be a significant adverse impact because offsite receptors were determined to be within 0.1 mile of some affected facilities. Similarly, during transport of LNG, it was estimated that the adverse impacts from various releases could extend 0.3 mile, which was also concluded to be a significant adverse hazard impact. If flaring natural gas is chosen in lieu of complying with PAR 1110.2 hazard impacts identified in the 2007 Final EA from storing LNG at affected facilities or from transporting LNG would be eliminated.

Flaring biogas in lieu of complying with PAR 1110.2 was not analyzed in the 2007 Final EA. However, any flaring of biogas used in lieu of complying with PAR 1110.2 would occur at existing affected facilities using in existing biogas-fueled flares. Since biogas would be flared

on-site, there would be no hazards associated with transportation. Combustion of biogas in a flare or ICEs is considered a safety measure that prevents releases of biogas into environment, since it would prevent a build-up of biogas at landfills or sewage treatment facilities. The flares are considered a means of controlling biogas during upsets in the existing ICEs.

Existing digester gas facilities have emergency standby generators that can be used to support the plant during emergencies, if the biogas-fueled engines are replaced by the flaring of biogas. Landfill gas facilities typically do not use emergency standby generators. The 2007 Final EA assumed that affected facility operators would install emergency engines at digester gas facilities that replaced their ICEs with alternative technologies in lieu of complying with the existing rule. If emergency engines are installed at an affected facility, the impacts would be no greater than those analyzed in the 2007 Final EA. Therefore, no new hazards or hazardous material impacts are expected from emergency standby generators. The 2007 Final EA estimated that approximately six gallons of diesel fuel per day or 194 million cubic feet per day of natural gas may be required at a single facility to fuel new emergency standby generators. Because of its low vapor pressure, hazards from the transportation or handling of diesel fuel were concluded to be less than significant. Implementing PAR 1110.2 would not change this conclusion. New natural gas emergency standby generators are expected to be used at facilities that already have natural gas service; therefore, no new hazards are expected from the use of natural gas to fuel new emergency standby generators.

As explained above, PAR 1110.2 is not expected to create a significant new or additional hazard to the public or create a reasonably foreseeable upset condition involving the release of hazardous materials greater than what was reported in the 2007 Final EA.

Government Code §65962.5 refers to hazardous waste handling practices at facilities subject to the Resources Conservation and Recovery Act (RCRA). Though some of the affected facilities subject to 2008 amendments to Rule 1110.2 may be included on the list of the hazardous materials sites compiled pursuant to Government Code §65962.5, compliance with the proposed project is not expected to affect in any way any facility's current hazardous waste handling practices. Hazardous wastes from the existing facilities are required to be managed in accordance with applicable federal, state, and local rules and regulations. As a result, the NOP/IS for the 2007 Final EA concluded that potential hazard impacts at any affected facilities subject to Government Code §65962.5 would be less than significant. Since PAR 1110.2 would not require construction such as the installation of control equipment utilizing catalysts (that could later be processed as hazardous waste), no additional waste is expected to be generated from the proposed project. Further, for those affected facilities which already use catalyst, the collected spent catalyst would continue to be handled in the same manner under PAR 1110.2 as currently handled such that it would be disposed/recycled at approved facilities. Consequently, hazards impacts from the disposal/recycling of hazardous materials as a result of implementing PAR 1110.2 would not change the significance conclusion in the NOP/IS for the 2007 Final EA.

Airports and Airstrips

The 2007 Final EA concluded that, because of the potential for significant adverse impacts from storing or transport of ammonia or LNG could occur within two miles of an airport or airstrip, it was concluded that impacts to these types of facilities would be significant. However, as explained above, flaring biogas instead of complying with the PAR 1110.2 would be expected to reduce this significant impact somewhat. Therefore, PAR 1110.2 is not expected to result in a

greater safety hazard impacts for people residing or working in an affected facility project area that is within the vicinity of an airport than disclosed in the 2007 Final EA.

Emergency Response Plans

The NOP/IS for the 2007 Final EA concluded that impacts to local emergency response plans would not be significant. Emergency response plans are typically prepared in coordination with the local city or county emergency plans to ensure the safety of not only the public (surrounding local communities), but the facility employees as well. The proposed project is not expected to impair implementation of, or physically interfere with any adopted emergency response plan or emergency evacuation plan. Any existing facilities affected by the proposed project would typically already have their own emergency response plans in place. Since existing facilities currently flare biogas, any additional flaring of biogas is expected to fall within procedures found in existing emergency response plans. Thus, PAR 1110.2 is not expected to impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, so it would not change the conclusion of insignificance for this topic in the NOP/IS for the 2007 Final EA.

Flammable Materials and Fire Hazards

The NOP/IS for the 2007 Final EA concluded that wildfire risk impacts from the 2008 amendments to Rule 1110.2 would not be significant since existing biogas-fueled ICEs would not be expected to increase the use of flammable materials in or near areas with flammable brush, grass, or trees because operators of affected facilities would not alter the type or amount of fuel used when replacing or retrofitting engines. In addition, affected facilities are often located in urbanized, industrial areas and no wildlands are expected to be located in the immediate or surrounding areas. Finally, no substantial or native vegetation is expected to exist within the operational portions of any of the affected facilities, since existing ICE systems are operating at these facilities. Flaring biogas in lieu of complying with PAR 1110.2 is not expected to alter the conclusion in the NOP/IS that wildfire risk impacts would be less than significant.

It was concluded in the NOP/IS for the 2007 Final EA that the 2008 amendments to Rule 1110.2 would not create significant adverse flammability impacts because none of the control technologies or monitoring equipment is expected to use flammable materials (aqueous ammonia is not flammable). Further, the 2008 amendments to Rule 1110.2 would not require a change in operation, fuels consumed or stored. Flaring biogas in lieu of complying with PAR 1110.2 would not alter the conclusion in the NOP/IS because no additional fuels or flammable materials are associated with flaring biogas.

Based upon these considerations, the proposed project would not substantially alter the significant adverse hazards and hazardous materials impacts identified in the NOP/IS for the 2008 amendments to Rule 1110.2 or the 2007 Final EA because no new significant or substantially worse hazards and hazardous materials impacts are expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse hazards and hazardous materials impacts were identified, no mitigation measures are necessary or required.

Hydrology and Water Quality

The NOP/IS for the 2007 Final EA concluded that hydrology and water quality from implementing the 2008 amendments to Rule 1110.2 impacts would not be significant. PAR 1110.2 includes the same biogas concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NOx compliance dates to January 1, 2016 or January 1, 2018 under the alternative compliance option. The analysis of hydrology and water quality impacts would be the same as proposed in the 2008 amendments to Rule 1110.2, which were not deemed significant for adverse hydrology and water quality impacts in the 2007 Final EA. Any hydrology or water quality impacts would only occur at a later date.

Flaring biogas in lieu of complying with PAR 1110.2 was not analyzed in the 2007 Final EA. However, any flaring of biogas in lieu of complying with PAR 1110.2 would occur in existing biogas-fueled flares. Any increase in flaring of biogas is not expected to require any new or additional water use or wastewater discharge because flares typically do not involve the use of water. Therefore, PAR 1110.2 would not adversely affect water resources, water quality standards, groundwater supplies, water quality degradation, existing water supplies or wastewater treatment facilities.

Because the affected engines and after treatments in PAR 1110.2 do not utilize water for their operations, no changes to any existing wastewater treatment permits would be necessary. As a result, the proposed project is not expected to affect any affected facility's ability to comply with existing wastewater treatment requirements or conditions from any applicable Regional Water Quality Control Board or local sanitation district because the proposed project has no effect on existing wastewater generation.

The NOP/IS for the 2007 Final EA concluded that any construction activities requiring water for dust suppression for the installation of after treatment or removal of equipment would be minor and, therefore, would not require substantial amounts of water. Any disposal of existing ICEs as a result of flaring in lieu of complying with PAR 1110.2 is not expected to require using any water or generate any wastewater. The disposal of existing ICEs is not expected to require earthmoving, ICEs are on existing concrete pads, so additional watering for fugitive dust control pursuant to Rule 403 would be not necessary for PAR 1110.2. As a result, PAR 1110.2 would not alter the conclusions in the NOP/IS that the 2008 amendments to Rule 1110.2 would not have significant adverse effects on any existing drainage patterns, increase the rate or amount of surface runoff water that would exceed the capacity of existing or planned stormwater drainage systems.

The NOP/IS for the 2007 Final EA concluded that the 2008 amendments to Rule 1110.2 would not be not expected to require any new or additional construction activities to build additional housing that could be located in 100-year flood hazard areas. Similarly, PAR 1110.2 is not expected to result in placing housing in 100-year flood hazard areas that could create new flood hazards. Since there is no new or additional construction associated with PAR 1110.2, the proposed project is not expected to alter the conclusion of insignificance regarding placing housing in a 100-year flood zone in the NOP/IS.

The NOP/IS for the 2007 Final EA concluded that the 2008 amendments to Rule 1110.2 would not create significant adverse risk impacts from seiches, tsunamis, or mudflows. PAR 1110.2

would only delay the installation of after treatment on affected engines or alternative technologies used in lieu of complying with PAR 1110.2. No new facilities are expected to be constructed as a result of the proposed project. Thus, no new flood risks or risks from seiches, tsunamis or mudflow conditions would result from the implementation of PAR 1110.2. Further, any risks from seiches, tsunamis, or mudflows would be part of the existing setting. Consequently, PAR 1110.2 would not alter any conclusions in the NOP/IS regarding risks from seiches, tsunamis, or mudflows.

The NOP/IS for the 2007 Final EA concluded that the 2008 amendments to Rule 1110.2 would not create significant adverse impacts to wastewater or stormwater drainage facilities. Because the engines subject to PAR 1110.2 and emissions control equipment do not utilize water for their operations, no new or increase in wastewater that could exceed the capacity of existing stormwater drainage systems or require the construction of new wastewater or stormwater drainage facilities would be expected as a result of complying with the proposed project. Biogas facilities currently manage stormwater; no change in stormwater management would be expected. Consequently, PAR 1110.2 would not alter any conclusions in the NOP/IS regarding affects to wastewater or stormwater drainage facilities.

Based upon these considerations, the proposed project would not substantially alter the conclusions in the NOP/IS that significant adverse hydrology and water quality impacts, since significant or substantially worse hydrology and water quality impacts are not expected from the implementation of the 2008 amendments to Rule 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse hydrology and water quality impacts were identified, no mitigation measures are necessary or required.

Land Use and Planning

The NOP/IS for the 2007 Final EA concluded that land use and planning impacts would not be significant. PAR 1110.2 includes the same biogas NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. PAR 1110.2 would only delay the installation and use of emissions control after treatment for stationary engines fired by biogas or replacement of ICEs in lieu of complying with PAR 1110.2. All construction and operations activities are expected to occur on-site at biogas facilities. Therefore, the proposed project is not expected alter any conclusions in the NOP/IS that the 2008 amendments to Rule 1110.2 would not create divisions in any existing communities.

The NOP/IS for the 2007 Final EA concluded that the 2008 amendments to Rule 1110.2 would not create significant adverse land use and planning impacts. There are no provisions in PAR 1110.2 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments, and since PAR 1110.2 would only affect biogas-fueled engines, no land use or planning requirements would be altered by the proposed project. Further, PAR 1110.2 would be consistent with the typical industrial, commercial, and institutional zoning of the affected facilities. Operations of affected engines at biogas facilities would still be expected to comply, and not interfere, with any applicable land use plans, zoning ordinances, habitat conservation or natural community conservation plans.

Based upon these considerations, the proposed project would not substantially alter the significant adverse land use and planning impacts detailed in the 2007 Final EA, since significant or substantially worse land use and planning impacts are not expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse land use and planning impacts were identified, no mitigation measures are necessary or required.

Mineral Resources

The NOP/IS for the 2007 Final EA concluded that material resource impacts would not be significant. PAR 1110.2 includes the same biogas NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. PAR 1110.2 would only delay the installation and use of emissions control after treatment for stationary engines fired by biogas or replacement of ICEs in lieu of complying with PAR 1110.2. All construction and operations activities are expected to occur on-site at biogas facilities. Therefore, the proposed project is not expected alter any conclusions in the NOP/IS that the 2008 amendments to Rule 1110.2 would not result in the loss of availability of a known mineral resource of value to the region and the residents of the state such as aggregate, coal, clay, shale, et cetera, or of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Based upon these considerations, the proposed project would not substantially alter the significant adverse mineral resource impacts detailed in the 2007 Final EA, since significant or substantially worse mineral resources impacts are not expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse mineral resources impacts were identified, no mitigation measures are necessary or required.

Noise

The NOP/IS for the 2007 Final EA concluded that noise impacts would not be significant. PAR 1110.2 includes the same biogas NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. PAR 1110.2 would only delay the installation and use of emissions control after treatment for stationary engines fired by biogas or replacement of ICEs in lieu of complying with PAR 1110.2. All construction and operations activities are expected to occur on-site at biogas facilities, which are typically located in remote areas that are not adjacent to residences. Therefore, the proposed project is not expected alter any conclusions in the NOP/IS that the 2008 amendments to Rule 1110.2 would not create new noise or vibration impacts.

Operation of affected biogas-fueled engines typically results in the generation of a certain amount of noise and vibration. However, it is expected that affected engines fired by biogas are already in compliance with all existing noise control laws or ordinances. Further, Occupational Safety and Health Administration (OSHA) and California-OSHA (Cal/OSHA) have established noise standards to protect worker health. The NOP/IS concluded that PAR 1110.2 compliant ICEs and any technology used in lieu of complying with PAR 1110.2 were not expected not generate additional or new noise, excessive groundborne vibration, or substantially increase

ambient noise levels beyond existing levels. PAR 1110.2 would implement the concentration limits for biogas-fueled engines at a later date. Therefore, any noise from after treatment or technology used in lieu of complying with PAR 1110.2 required by the existing Rule 1110.2, which was not deemed to be significant in the 2007 Final EA, would only occur at a later date.

Flaring biogas in lieu of complying with PAR 1110.2 was not analyzed in the 2007 Final EA. However, flaring of biogas currently occurs at affected facilities; therefore, additional flaring of biogas, would not add any new noise, excessive groundborne vibration, or substantially increase ambient noise levels beyond existing levels.

Although not likely, some of the facilities affected by PAR 1110.2 may be located at sites within an airport land use plan, or within two miles of a public airport, implementation of the proposed project would not expose people residing or working in the project area to the same degree of excessive noise levels associated with airplanes. All noise producing equipment must comply with local noise ordinances and applicable OSHA or Cal/OSHA workplace noise reduction requirements.

Based upon these considerations, the proposed project would not substantially alter the significant adverse noise impacts detailed in the 2007 Final EA, since significant or substantially worse noise impacts are not expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse noise impacts were identified, no mitigation measures are necessary or required.

Population and Housing

The NOP/IS for the 2007 Final EA concluded that impacts to population and housing would not be significant. PAR 1110.2 includes the same biogas NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. PAR 1110.2 would only delay the installation and use of emissions control after treatment for stationary engines fired by biogas or replacement of ICEs in lieu of complying with PAR 1110.2. All construction and operations activities are expected to occur on-site at biogas facilities. Therefore, the proposed project is not expected alter any conclusions in the NOP/IS that the 2008 amendments to Rule 1110.2 would not create new impacts to population or housing.

Human population within the SCAQMD's jurisdiction is anticipated to grow regardless of implementing PAR 1110.2. No component of PAR 1110.2 would require additional construction employees than was analyzed in the April 20, 2007 NOP/IS for the 2007 Final EA. Similarly, additional employees would not be required during operation because the proposed project would only delay the operation of after treatment or technology used in lieu of complying with PAR 1110.2.

District population is not expected to be affected directly or indirectly as a result of adopting and implementing PAR 1110.2. Further, PAR 1110.2 would not indirectly induce growth in the area of facilities with affected engines. The construction of single- or multiple-family housing units would not be required as a result of implementing the proposed project since no new employees would be required at affected facilities. The proposed project is not expected to require relocation of affected engines or facilities, so existing housing or populations in the district are

not anticipated to be displaced necessitating the construction of replacement housing elsewhere. As a result, the proposed project is not anticipated to generate any significant adverse effects, either direct or indirect, on population growth in the district or population distribution.

Based upon these considerations, the proposed project would not substantially alter the significant adverse population and housing impacts detailed in the 2007 Final EA, since significant or substantially worse population and housing impacts are not expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse population and housing impacts were identified, no mitigation measures are necessary or required.

Public Services

The NOP/IS for the 2007 Final EA concluded that impacts to public services would not be significant. As noted in the “Hazards and Hazardous Materials” discussion, PAR 1110.2 would not involve the use of any new acutely hazardous materials. As a result, no new fire hazards or increased use of hazardous materials would be introduced at existing affected facilities that would require emergency responders such as police or fire departments. Thus, no new demands for fire or police protection are expected from PAR 1110.2 since the proposed rule amendments would only delay the installation of emission control devices or technology used in lieu of complying with PAR 1110.2 and associated equipment.

As noted in the “Population and Housing” discussion, implementation of the proposed project would not require new employees for construction because no new or additional construction activities would be necessary to comply with PAR 1110.2 for affected engines beyond what was previously analyzed in the 2007 Final EA. Only the installation and operation of after treatment or replacement technology used in lieu of complying with PAR 1110.2 would take place at a later date. Similarly, no new employees would be required to maintain operation of the affected engines or alternative technologies other than what was evaluated previously in the 2007 Final EA. As a result, PAR 1110.2 would have no direct or indirect effects on population growth in the district. Therefore, there would be no increase in local population and thus no impacts are expected to local schools or parks.

Because the proposed project would only resulting in construction and operational activities occurring at a later date that may require new or altered permits, implementation of PAR 1110.2 would not trigger a need for additional government services than what was analyzed in the 2007 Final EA. Further, the proposed project would not result in the need for new or physically altered government facilities in order to maintain acceptable service ratios, response times, or other performance objectives. There would be no increase in population and, therefore, no need for physically altered government facilities.

Based upon these considerations, the proposed project would not substantially alter the significant adverse public service impacts detailed in the April 20, 2007 NOP/IS for the 2007 Final EA, since significant or substantially worse public services impacts are not expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse public services impacts were identified, no mitigation measures are necessary or required.

Recreation

The NOP/IS for the 2007 Final EA concluded that recreation impacts would not be significant. As previously discussed under “Land Use,” there are no provisions in PAR 1110.2 that would affect land use plans, policies, or regulations. Land use and other planning considerations are determined by local governments; no land use or planning requirements would be altered by the proposed project. Further, implementation of PAR 1110.2 would not increase the use of existing neighborhood and regional parks or other recreational facilities or include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment because the proposed project is not expected to induce population growth.

Based upon these considerations, the proposed project would not substantially alter the significant adverse recreation impacts detailed in the 2007 Final EA, since significant or substantially worse recreation impacts are not expected from the implementation of PAR 1110.2 and, therefore, an addendum is appropriate. Since no significant or substantially worse recreation impacts were identified, no mitigation measures are necessary or required.

Solid and Hazardous Wastes

The NOP/IS for the 2007 Final EA concluded that solid and hazardous waste impacts would not be significant. PAR 1110.2 includes the same biogas NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. PAR 1110.2 would only delay the installation and use of emissions control after treatment for stationary engines fired by biogas or replacement of ICEs in lieu of complying with PAR 1110.2. All construction and operations activities are expected to occur on-site at biogas facilities. Therefore, the proposed project is not expected alter any conclusions in the NOP/IS for the Final EA that would create new solid or hazardous waste impacts.

Flaring biogas in lieu of complying with PAR 1110.2 was not analyzed in the 2007 Final EA. However, any flaring of biogas in lieu of complying with PAR 1110.2 would occur in existing biogas-fueled flares. Additional flare of biogas is not expected to generate any additional solid/hazardous waste. Flaring biogas in lieu of complying with PAR 1110.2 may result in the disposal of ICEs. However, the early disposal of ICEs was determined not to be significant in the 2007 Final EA. Therefore, no significant solid/hazardous waste impacts are expected, if operators choose to flaring biogas in lieu of complying with PAR 1110.2.

Based on the April 20, 2007 NOP/IS for the 2007 Final EA, implementing PAR 1110.2 not expected to hinder in any way any affected facility’s ability to comply with existing federal, state, and local regulations related to solid and hazardous wastes. Consequently, it is anticipated that operators of affected facilities would continue to comply with federal, state, and local statutes and regulations related to solid and hazardous waste handling and disposal.

Based on these considerations, PAR 1110.2 is not expected to increase the volume of solid or hazardous wastes that cannot be handled by existing municipal or hazardous waste disposal facilities, or require additional waste disposal capacity other than already analyzed in the Final EA, which was determined to be less than significant for solid/hazardous waste. Further, implementing PAR 1110.2 is not expected to interfere with any affected facility’s ability to

comply with applicable local, state, or federal waste disposal regulations. Since no new significant or substantially worse solid/hazardous waste impacts were identified, no mitigation measures are necessary or required and an addendum is appropriate.

Traffic/Transportation

The NOP/IS for the 2007 Final EA concluded that traffic/transportation impacts would not be significant. PAR 1110.2 includes the same biogas NO_x concentration limits for biogas-fueled ICEs that would have become effective July 1, 2012, if the technology review had been completed in 2010. The current proposal would extend the effective final NO_x compliance dates that extend out to January 1, 2016 or January 1, 2018 under the alternative compliance option. PAR 1110.2 would only delay the installation and use of emissions control after treatment for stationary engines fired by biogas or replacement of ICEs in lieu of complying with PAR 1110.2. All construction and operations activities are expected to occur on-site at biogas facilities. Therefore, the proposed project is not expected alter any conclusions in the April 20, 2007 NOP/IS for the 2007 Final EA that the 2008 amendments to Rule 1110.2 would not create new traffic/transportation impacts.

As noted in the “Discussion” sections of other environmental topics, compliance with PAR 1110.2 is not expected to require construction activities or the installation of control equipment other than what was already evaluated in the NOP/IS. The NOP/IS estimated that 50 delivery and 75 worker trips per day would be required during construction, 76 ammonia trips would be required per quarter and 11 trips every three years would be required to replace catalyst. These values were updated in the 2007 Final EA in the section titled “Potential Environmental Impacts Found Not to Be Significant,” based on the environmental analysis of construction air quality impacts. The construction air quality analysis in the 2007 Final EA concluded that a maximum of 62 new truck trips during construction would occur. Because the maximum number of truck trips during construction was less than the number of truck trips identified in the April 20, 2007 NOP/IS for the in the 2007 Final EA, the conclusion that transportation/traffic impacts would not to be significant is unchanged. The siting of each affected facility is expected to be consistent with surrounding land uses and traffic/circulation in the surrounding areas of the affected facilities. Similarly, the maximum number of truck trips during operation was updated as part of the air quality analysis. Alternative technologies in lieu of complying with PAR 1110.2 were estimated to need a maximum of 114 truck trips per day. Although this number is higher than what was discussed in the April 20, 2007 NOP/IS for the 2007 Final EA, it would not exceed any of the SCAQMD’s transportation/traffic significance thresholds and, therefore, was concluded to be less than significant for transportation/traffic. Operation of PAR 1110.2 and existing Rule 1110.2 engines are expected to utilize similar number of employees, so no increase in employee trips are expected.

Flaring biogas in lieu of complying with PAR 1110.2 was not analyzed in the 2007 Final EA. However, any flaring of biogas in lieu of complying with PAR 1110.2 would occur at existing affected facilities using existing biogas-fueled flares. Therefore, no construction would be required. Affected operators that flare biogas in lieu of complying with PAR 1110.2 may remove biogas-fueled ICEs. PAR 1110.2 may result in the early removal of the biogas-fueled engines, but the impacts would be the same as removing them at a later date, which was evaluated in the April 27 NOP/IS 2007 Final EA and refined in the 2007 Final EA based on the air quality analysis.

Existing digester gas facilities have emergency standby generators that can be used to support the plant during emergencies, if the biogas-fueled engines are replaced by flares. Landfill gas facilities typically do not use emergency standby generators. The 2007 Final EA assumed that emergency engines would be installed at digester gas facilities that replaced their ICEs with alternative technologies in lieu of complying with the existing rule. If emergency engines are installed at an affected facility, the impacts would be no greater than those analyzed in the NOP/IS and 2007 Final EA. Therefore, no new impacts are expected to traffic/transportation from emergency standby generators. However, if new emergency standby generators are needed they are expected to be dropped in place on existing concrete surfaces within the boundaries of existing biogas facilities.

Since there would be no greater construction or change in operations that would affect traffic/transportation other than what was already evaluated in the NOP/IS and 2007 Final EA and determined to be less than significant for transportation/traffic, there would be no change to traffic/circulation. Therefore, PAR 1110.2 is not expected to conflict with an applicable plan, policy establishing measures of effectiveness for the performance of the circulatory system, applicable congestion management program, or conflict with adopted policies, plans or programs regarding public transit, bicycle or pedestrian facilities.

Though some of the facilities that would be affected by PAR 1110.2 may be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, any actions that would be taken to comply with the proposed project are not expected to influence or affect air traffic patterns or navigable air space based on the NOP/IS. Thus, PAR 1110.2 would not result in a change in air traffic patterns including an increase in traffic levels or a change in location that results in substantial safety risks.

The proposed project would not substantially change the way the affected engines would operate in relationship to transportation/traffic. Based on the analysis in the April 20 NOP/IS for the 2007 Final EA, the proposed project does not involve construction of any roadways or other transportation design features, so there would be no change to current roadway designs that could increase traffic hazards. Thus, the proposed project is not expected to substantially increase traffic hazards or create incompatible uses at or adjacent to the affected facilities.

Based on the analysis in the April NOP/IS for the 2007 Final EA, emergency access at each affected facility is not expected to be impacted by the proposed project. Further, each affected facility is expected to continue to maintain their existing emergency access gates. Since PAR 1110.2 does not involve any new construction activities not evaluated in the April NOP/IS for the 2007 Final EA and is not expected to alter operation of affected engines, the proposed project is not expected to increase hazards due to design features or alter emergency access.

Based upon these considerations, the proposed project would not substantially alter the significant adverse transportation/traffic impacts detailed in the April 20, 2007 NOP/IS for the 2007 Final EA or the 2007 Final EA, since significant or substantially worse transportation/traffic impacts are not expected from the implementation of PAR 1110.2; therefore, an addendum is appropriate. Since no significant or substantially worse transportation/traffic impacts were identified, no mitigation measures are necessary or required.

CONCLUSION

Analysis of the proposed project indicated that an Addendum the 2007 Final EA prepared pursuant to CEQA Guidelines §15164 is the appropriate CEQA document to analyze the potential adverse environmental impacts associated with PAR 1110.2 because SCAQMD staff has concluded that the proposed amendments result in some changes or additions to the 2007 Final EA; but that based on the analysis in this addendum, no new significant environmental effects or a substantial increase in the severity of previously identified significant effects were identified, thus none of the conditions described in CEQA Guidelines §15162 calling for preparation of a subsequent EIR have occurred:

1. No substantial changes are proposed in the project which required major revision of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
2. No substantial changes would occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
3. No new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete shows any of the following:
 - A. The project will have one or more significant effects not discussed in the previous EIR;
 - B. Significant effects previously examined with be substantially more severe than shown in the previous EIR;
 - C. Mitigation measures or alternatives previously found not to be feasible would be in fact feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the migration measure or alternative; or
 - D. Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the migration measure or alternative.

Based on the analysis in this addendum, PAR 1110.2 would not generate new significant environmental effects or a substantial increase in the severity of previously identified significant effects. Since PAR 1110.2 would not generate new significant environmental effects or a substantial increase in the severity of previously identified significant effects, no new mitigation measures or alternatives have been proposed. No changes to existing mitigation measures or alternatives are proposed. This conclusion is supported by substantial evidence provided as part of the environmental analysis in this Addendum as well as other documents in the record.

APPENDIX A

PROPOSED AMENDED RULE 1110.2

In order to save space and avoid repetition, please refer to the latest version of the PAR 1110.2 located elsewhere in the final rule package.

APPENDIX B

ASSUMPTIONS AND CALCULATIONS

Criteria Pollutant Emissions from Flares

Inputs/assumptions from the 2007 Final EA:

Total biogas use for the engines based on the 2008 survey is 4.45×10^{12} Btu or 4.45×10^6 mmBtu.

Emission factors based on flare permit limits -

The average flare emission factor for NO_x is 0.056 lb/mmBtu.

Emissions are:

249,200.00 lb/yr

682.74 lb/day

The average flare emission factor for VOC is 0.035 lb/mmBtu.

Emissions are:

155,750.00 lb/yr

426.71 lb/day

The average flare emission factor for CO is 0.115 lb/mmBtu.

Emissions are:

511,750.00 lb/yr

1,402.05 lb/day