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Huntington Beach Energy Project

(12-AFC-02C)

Data Responses, Set 1-R3

(Revised and Updated Response to Data Request A6 [Air Quality])

Submitted to

California Energy Commission

Prepared by

AES Huntington Beach Energy, LLC

With Assistance from

CH2MHILL®

Suite 600
Sacramento, CA 95833

September 1, 2016

Contents

Introduction

Attached are AES Huntington Beach Energy, LLC's (AES or the Project Owner) revised and updated response to the California Energy Commission (CEC) Data Request, Set 1 (Air Quality, number A6-R3) regarding the Huntington Beach Energy Project (HBEP) (12-AFC-02C) Petition to Amend (PTA).

New, revised or updated tables or attachments are numbered in reference to the Data Request number. For example, the first table used in response to Data Request A6 would be numbered Table A6-1. The first attachment used in response to Data Request A6 would be Attachment A6-1, and so on.

Air Quality (A6)

CUMULATIVE AIR QUALITY IMPACTS

BACKGROUND

The PTA (Section 5.1.6 and Appendix 5.1F) describes the methodology for the cumulative effects analysis but does not include the analysis because a project list had not been provided by the District at the time the PTA was prepared. The cumulative analysis should include all reasonably foreseeable projects within a 6-mile radius, i.e. the projects that have received construction permits but are not yet operational, and those that are in the permitting process or can be expected to be in permitting in the near future. A complete cumulative impacts analysis should identify all existing and planned stationary sources that affect the baseline conditions and consider them in the modeling effort.

DATA REQUESTS

A6. Please provide the cumulative modeling and impact analysis, including amended HBEP and other identified existing and planned projects within 6 miles of the amended HBEP site.

Response A6-R3: The Project Owner's list of cumulative sources was provided in response to Data Request A6-R2, submitted to CEC on August 25, 2016 (Transaction Number [TN] #212942). The CEC provided concurrence of this list, with minor modifications, via e-mail on August 29, 2016. Refer to Attachment A6-1 for a copy of relevant correspondence and CEC's subsequent approval. Additional background on the development of this list, such as the facilities evaluated but ultimately removed from the list of potential cumulative sources, was previously submitted to CEC on January 17, 2013 (TN #69182) and August 25, 2016 (TN #212942).

Table A6-1 presents a final list of the facilities that have been included in the HBEP cumulative air quality impact assessment. Attachment A6-2 provides a summary of the information used to develop the list of facilities included in the cumulative impact assessment.

TABLE A6-1
HBEP Cumulative Impact Sources

Facility Name	Number of Sources	Permit Application Number(s)	Description
HBEP	5	N/A	Addition of two combined-cycle natural gas combustion turbines, two simple-cycle natural gas combustion turbines, and one natural gas auxiliary boiler.
Orange County Sanitation District, Fountain Valley	5	546360, 546361, 546362, 494460, 568969	Change of conditions for three digester gas ICEs and addition of one natural gas boiler and one abrasive blasting cabinet.
Orange County Sanitation District, Huntington Beach	8	474766, 474767, 474768, 474769, 474770, 455673, 455671, 455670	Change of conditions for five emergency diesel ICEs (permitted February 27, 2008) and addition of three emergency diesel ICEs (permitted April 12, 2006).
Arlon Graphics, LLC	1	534234	Addition of one RTO.
Huntington Beach City, Water Department	1	561605	Addition of one emergency natural gas ICE.
Fabrica	2	572751, 566167	Addition of one plasma arc cutter and one natural gas ICE generator.
So Cal Holding, LLC	1	555370	Addition of one emergency diesel ICE.

TABLE A6-1
HBEP Cumulative Impact Sources

ICE = internal combustion engine
N/A = Not applicable
RTO = recuperative thermal oxidizer

Cumulative Air Quality Impact Analysis

The cumulative air quality impact analysis was conducted using the methodology presented in the *Dispersion Modeling Protocol for the Amended Huntington Beach Energy Project* and associated modeling protocol addendum (see Appendix 5.1F of the HBEP PTA), with the exception of the receptor grid. Receptors within the cumulative facility fence lines were removed from the model setup because they would not be representative of ambient conditions.

Modeling Parameters

The emission and exhaust parameters used to estimate the cumulative impacts are presented in Attachment A6-3, Tables 1 and 2. Because emission rates for particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) were not available for some cumulative sources, it was conservatively assumed that $PM_{2.5}$ emission rates for these sources were equal to those of particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}). The source parameters were based on the following data sources. A summary of the dispersion modeling inputs and output is also included in Attachment A6-3. The modeling files are included with this submission on compact disc.

Huntington Beach Energy Project:

- Source parameters and emission rates are based on the updated HBEP operating profile submitted to CEC on April 6, 2016 (TN #210969).
- Source parameters and emission rates were selected according to the operating scenarios, which include start-up and shutdown emissions, resulting in the maximum predicted impacts presented in Table 5.1-24 of the revised PTA, submitted to CEC on April 6, 2016.

Orange County Sanitation District (Facility ID 17301):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from South Coast Air Quality Management District (SCAQMD) on November 2, 2012, May 13, 2015, and May 4, 2016.
- Source locations were not available for the three digester gas internal combustion engines (ICEs) and permitted boiler. Therefore, these modeled sources were placed at the property centroid.
- The short-term oxides of nitrogen (NO_X) emissions from the permitted boiler were modeled at 15 parts per million (ppm), based on the permit limit beginning in 2015.
- Emissions from the abrasive blasting cabinet were assumed to be limited to particulates (PM_{10}/$PM_{2.5}$). It was assumed that all particulates were less than 2.5 microns in diameter.

Orange County Sanitation District (Facility ID 29110):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on October 25, 2012, with additional data provided by SCAQMD on November 29, 2012.
- The source locations were not available in the permitted source data. Therefore, the modeled sources were placed at the property centroid.
- The permit applications for the five emergency diesel ICEs (permitted February 27, 2008) are for a change in conditions only (increasing annual operating hours for each engine from 30 to 50 hours). Therefore, there was

no increase in short-term emissions from these sources and the annual emissions modeled reflect only the increase in total emissions.

- As stack parameters were unavailable for the three emergency diesel ICEs (permitted April 12, 2006), it was assumed these were equivalent to the five emergency diesel ICEs previously described.
- All eight sources are permitted for up to 50 hours per year of maintenance and testing. The simultaneous testing of all emergency diesel ICEs is not reasonably expected to occur within the same hour. Therefore, one emergency ICE with the highest hourly emission rates was modeled.
- Emergency sources (like the ICEs) were not modeled for the federal 1-hour NO_X and sulfur dioxide (SO_2) standards as these are statistical average standards that will not likely be influenced by sources permitted to operate for up to 50 hours per year for testing and maintenance.

Arlon Graphics, LLC (Facility ID 167066):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on October 24, 2012, with additional data provided by SCAQMD on December 5, 2012.
- Permit application numbers 534234 and 532302 were for new construction of a recuperative thermal oxidizer (RTO) and reductions to the permit limits of an existing RTO, respectively. The result of these permits is a net increase of emissions of carbon monoxide (CO), SO_2, PM_{10}, and $PM_{2.5}$, and a net decrease in emissions of NO_X. Therefore, only the increase in short-term and annual emissions were modeled using the stack parameters of the new RTO.
- The source location was not available in the permitted source data. Therefore, the modeled source was placed at the property centroid.

Huntington Beach City, Water Department (Facility ID 20231):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on May 5, 2015.
- The stack diameter was not available in the permitted source data. Therefore, a stack diameter of 8 inches was assumed, based on engineering judgment.

Fabrica (Facility ID 95212):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on July 19, 2016.
- For the plasma arc cutter:
    - The stack parameters, apart from location, were not available in the permitted source data. Therefore, a stack diameter of 4 inches and an exhaust flow of 230 cubic feet per minute[1] were taken from the specification sheet for the permitted Avani Environmental SPC-230 fume extraction unit.
    - The source is a moveable cart and was, therefore, assumed to be a ground-level source at ambient temperature.
    - Similarly, emission rates were not available in the permitted source data. Therefore, they were estimated using emission scenarios from The Swedish Institute of Production Engineering Research[2], as cited in Chapter 12 of AP-42, and a particulate control efficiency of 99.97 percent, as provided in the specification sheet noted above.

[1] The stack exhaust flow was converted to a stack exhaust velocity based on the stack diameter.

[2] Broman B. et al, The Swedish Institute of Production Engineering Research. 1994. *Emission of Fume, Nitrogen Oxides and Noise in Plasma Cutting of Stainless and Mild Steel*. March.

- Emissions from the plasma arc cutter were assumed to be limited to NO_X and particulates (PM_{10}/$PM_{2.5}$). It was assumed that all particulates were less than 2.5 microns in diameter.

- For the natural gas-fired ICE generator:
  - This source is part of a cogeneration system with an existing boiler and does not operate as an emergency/standby unit. Therefore, it was conservatively assumed to operate 8,760 hours per year.
  - The source emission rates for PM_{10}/$PM_{2.5}$ and SO_2 were not available in the permitted source data. Therefore, they were estimated using Table 3.2-1 of AP-42[3] and a fuel sulfur concentration of 0.75 grains per 100 cubic feet, respectively. A default heat content of 1,050 British thermal units per standard cubic foot was used, as necessary.
  - Similarly, the stack diameter, exhaust temperature, and exhaust velocity were not available in the permitted source data. Therefore, a stack diameter of 3.5 inches, an exhaust temperature of 1,384 degrees Fahrenheit (°F), and an exhaust flow of 1,499 cubic feet per minute[1] were taken from the specification sheet for a similarly-sized (200 kilowatt) natural gas-fired ICE generator.
  - The stack height was also not available in the permitted source data. Therefore, a stack height of 15 feet was assumed, based on engineering judgment.

So Cal Holding, LLC (Facility ID 169754):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on July 2, 2014.
- The stack exhaust temperature and exhaust velocity were not available in the permitted source data. Therefore, a stack exhaust temperature of 890 °F and an exhaust flow of 7,540 cubic feet per minute[1] were taken from the specification sheet for the permitted Cummins QST30-G5 NR2 engine.
- Similarly, the stack diameter was not available in the permitted source data. Therefore, a stack diameter of 10 inches was assumed, based on engineering judgment.

Modeling Results

As shown in Table A6-2, the maximum modeled cumulative NO_2, CO, SO_2, 24-hour PM_{10}, and $PM_{2.5}$ concentrations for all emission sources combined with the background concentrations do not exceed the ambient air quality standards (AAQS). The results of the cumulative modeling analysis also conservatively assume that the contribution to background air quality that results from the existing Huntington Beach Generating Station emissions would remain the same in the future. However, as noted in the PTA, all of the existing Huntington Beach Generating Station boiler units will be permanently retired either after completion of HBEP construction or due to the elimination of once-through-cooling consistent with the State Water Resources Control Board Policy for the Use of Coastal and Estuarine Waters for Power Plant Cooling. Therefore, the cumulative sources are not expected to cause or contribute to a violation of an AAQS, and the NO_2, CO, SO_2, 24-hour PM_{10}, and $PM_{2.5}$ impacts will be less than significant.

For annual PM_{10}, the background concentration exceeds the AAQS without the cumulative sources. As a result, the impact of the cumulative sources plus background also exceeds the AAQS and the operation of the cumulative sources would further contribute to an existing violation of the annual AAQS absent mitigation. Similar to the Final Decision for the Licensed HBEP, and as more fully described in the PTA, the cumulative operating impacts of the Amended HBEP after mitigation are less than significant. HBEP emissions will be fully offset consistent with SCAQMD Rules 1303 and 1304 using the SCAQMD internal offset bank, with additional PM_{10} reductions generated through the shutdown of the existing Huntington Beach Generating Station boiler units and through the SCAQMD's utilization of the Rule 1304.1 air quality improvement funding. Therefore, the annual PM_{10} impacts will be mitigated to a less-than-significant level.

[3] U.S. Environmental Protection Agency (EPA). 2000. *AP-42, Fifth Edition, Volume I*. Chapter 3: Stationary Internal Combustion Sources. Section 3.2, Natural Gas-fired Reciprocating Engines. August.

TABLE A6-2
Cumulative Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration for All Sources (µg/m³)	Background Concentration (µg/m³) [a]	Total Predicted Concentration (µg/m³)	State Standard (µg/m³)	Federal Standard (µg/m³)
NO_2 [b]	1-hour (max)	134	142.6	277	339	—
	1-hour (98th percentile) [c]	145	—	145	—	188
	Annual	3.35	22.0	25.4	57	100
SO_2	1-hour (max)	6.03	23.1	29.1	655	—
	1-hour (99th percentile) [d]	5.03	10.5	15.5	—	196
	3-hour [e]	5.29	23.1	28.4	—	1,300
	24-hour	1.7	3.7	5.4	105	—
CO	1-hour	631	3,450	4,081	23,000	40,000
	8-hour	149	2,222	2,371	10,000	10,000
PM_{10}	24-hour [f]	4.98	45	49.98	50	150
	Annual	0.64	24.2	24.8	20	—
$PM_{2.5}$	24-hour (98th percentile) [f, g]	2.95	27.8	30.8	—	35
	Annual	0.64	11.34	11.98	12	12

[a] Background concentrations were taken from Air Quality Table 6 of the CEC's HBEP Preliminary Staff Assessment (TN #211973).

[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75, respectively.

[c] The total predicted concentration for the federal 1-hour NO_2 standard is the 5-year average, high-8th-high modeled concentration combined with the 3-year average of 98th percentile seasonal hour-of-day background concentrations.

[d] The total predicted concentration for the federal 1-hour SO_2 standard is the 5-year average, high-4th-high modeled concentration combined with the representative background concentration.

[e] In the absence of monitored data, the maximum 1-hour background SO_2 concentration is conservatively used for the 3-hour background.

[f] Consistent with Table 5-1-26 of the PTA submitted to CEC on April 6, 2016, the 24-hour $PM_{10/2.5}$ concentrations are based on one General Electric (GE) 7FA.05 turbine operating 24 hours per day at minimum load and one GE 7FA.05 turbine operating 20 hours per day at minimum load and 4 hours per day at average load.

[g] The total predicted concentration for the 24-hour $PM_{2.5}$ standard is the 5-year average, high-8th-high modeled concentration combined with the representative background concentration.

Attachment A6-1
CEC Approval of Proposed Cumulative Source List

Engel, Elyse/SJC

Subject: FW: Huntington Beach Cumulative AQ Modeling [EXTERNAL]

From: Bemis, Gerry@Energy [mailto:Gerry.Bemis@energy.ca.gov]
Sent: Monday, August 29, 2016 2:49 PM
To: Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>
Cc: Qian, Wenjun@Energy <Wenjun.Qian@energy.ca.gov>; Layton, Matthew@Energy <Matthew.Layton@energy.ca.gov>
Subject: Huntington Beach Cumulative AQ Modeling [EXTERNAL]

Jerry:

Thank you for the last several emails to Wenjun refining and explaining the cumulative AQ modeling data, including as recently as this afternoon. We approve of the cumulative modeling approach, as refined in this series of emails. We need to know when you will docket:

1. The additional materials you sent in the emails?
2. The results of the cumulative modeling assessment?

Gerry Bemis
Air Resources Supervisor
Engineering Office
Siting, Transmission and Environmental Protection Division
916-654-4960

California Energy Commission
1516 Ninth Street, MS46
Sacramento, CA 95814

Engel, Elyse/SJC

Subject: FW: HBEP Cumulative AQ Modeling [EXTERNAL]

From: Salamy, Jerry/SAC
Sent: Monday, August 29, 2016 2:16 PM
To: Qian, Wenjun@Energy <Wenjun.Qian@energy.ca.gov>
Cc: Engel, Elyse/SJC <Elyse.Engel@ch2m.com>; Beattie, Benjamin/SAC <Benjamin.Beattie@CH2M.com>; Dunavent, Andrew/SDO <Andrew.Dunavent@ch2m.com>; Bemis, Gerry@Energy <Gerry.Bemis@energy.ca.gov>; Layton, Matthew@Energy <Matthew.Layton@energy.ca.gov>; Mason, Robert/SCO <Robert.Mason@CH2M.com>; Salazar, Cindy/SCO <Cindy.Salazar@CH2M.com>
Subject: RE: HBEP Cumulative AQ Modeling [EXTERNAL]

Hi Wenjun,

We incorrectly cited our conversions as being at standard temperature and pressure (STP). However, we used a normal temperature (293 K) in our Ideal Gas Law equation, instead of Standard Temperature (273 K). We believe this is appropriate as the tests described in the AP-42 referenced were not likely performed at STP. As such, we believe our calculations, shown below, are correct as submitted.

Hourly: [(5.4 L/min x 60 min/hour) x (46 g/mol / 453.6 g/lb) x 1 atm] / (0.08206 L-atm/mol-K x 293.15 K) = 1.37 lb/hr
Annual: 1.37 lb/hr x 8,760 hours/year / 2,000 lb/ton = 5.98 tpy

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From: Qian, Wenjun@Energy [mailto:Wenjun.Qian@energy.ca.gov]
Sent: Monday, August 29, 2016 1:14 PM
To: Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>
Cc: Engel, Elyse/SJC <Elyse.Engel@ch2m.com>; Beattie, Benjamin/SAC <Benjamin.Beattie@CH2M.com>; Dunavent, Andrew/SDO <Andrew.Dunavent@ch2m.com>; Bemis, Gerry@Energy <Gerry.Bemis@energy.ca.gov>; Layton, Matthew@Energy <Matthew.Layton@energy.ca.gov>; Mason, Robert/SCO <Robert.Mason@CH2M.com>; Salazar, Cindy/SCO <Cindy.Salazar@CH2M.com>
Subject: RE: HBEP Cumulative AQ Modeling [EXTERNAL]

Jerry,

I double checked the NOx emissions of the plasma cutter. Using 5.4 L/min of NOx and molar volume of 22.4 L/mole at STP conditions from Ideal Gas Law, I calculated the NOx emissions to be:

5.4 L/min / (22.4 L/mole) x 46 g/mole x 60 min/hr x (1 lb/453.6 g) = 1.467 lb/hr
1.467 lb/hr x 8760 hrs/yr x (1 ton/2000 lb) = 6.43 tpy

The NOx emissions in the pdf file you just sent were 1.37 lb/hr and 5.98 tpy. I would like to have some more clarifications on how you calculated these values and why they are different than mine.

Thanks.

Wenjun Qian, Ph.D., P.E.
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Wenjun.Qian@energy.ca.gov

From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Monday, August 29, 2016 12:33 PM
To: Qian, Wenjun@Energy
Cc: Elyse.Engel@ch2m.com; Benjamin.Beattie@CH2M.com; Andrew.Dunavent@ch2m.com; Bemis, Gerry@Energy; Layton, Matthew@Energy; Robert.Mason@CH2M.com; Cindy.Salazar@CH2M.com
Subject: FW: HBEP Cumulative AQ Modeling

Hi Wenjun,

Please see our responses to your comments on the HBEP cumulative air quality impact assessment methodology. Assuming our responses are acceptable, please let us know if you approve of our cumulative air quality impact assessment methodology so we can complete the modeling and submit the results this week.

1. Exit velocity of the ICE at Huntington Beach Water Department (Facility ID 20231):
   Page 5 of the HBW_ID20231_SupportingData.pdf shows the exhaust flow rate of 3761 lb/hr with exhaust temperature at 1116 F. And you assumed stack diameter of 8 in. At 1116 F, I calculated the air density to be 0.025 lb/ft^3. With the above information, I calculated the exit velocity to be:

   3761 lb/hr x 1 hr/3600s / (0.025 lb/ft^3 x π/4 x 0.667^2 ft^2) = 119 ft/s = 36.5 m/s

   But attachment A5-2R1 Table 1 shows that you are proposing an exit velocity of 15.1 m/s. I'd like to know why I got a different value.

   Response: We have reviewed your calculations and have revised the exit velocity to 36.5 m/s.

2. Emissions of the plasma arc cutter at Fabrica (Facility ID 95212):
   You assumed emissions from the plasma arc cutter are limited to PM emissions. However, Chapter 12 of AP-42 shows that the plasma arc cutter could also have NOx emissions. Could you model both NOx and PM emissions from the plasma arc cutter?

   Response: Although the SCAQMD did not issue either PM or NOx emission limits for the plasma arc cutter or the associated emission control device, we will model both NOx and PM emissions from this source. The proposed emission rates for both pollutants are captured in the attached file. Note that inclusion of this source altogether is conservative as, based on a review of aerial imagery, we believe the source to be fully enclosed within a building.

Thanks,

Jerry Salamy

Principal Project Manager
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From: Qian, Wenjun@Energy [mailto:Wenjun.Qian@energy.ca.gov]
Sent: Friday, August 26, 2016 3:58 PM
To: Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>; Bemis, Gerry@Energy <Gerry.Bemis@energy.ca.gov>; Layton, Matthew@Energy <Matthew.Layton@energy.ca.gov>
Cc: Engel, Elyse/SJC <Elyse.Engel@ch2m.com>; Beattie, Benjamin/SAC <Benjamin.Beattie@CH2M.com>; Dunavent, Andrew/SDO <Andrew.Dunavent@ch2m.com>
Subject: RE: HBEP Cumulative AQ Modeling [EXTERNAL]

Jerry,

Thank you for your responses and the supporting data sheets. I have two additional questions regarding the new sources:

1. Exit velocity of the ICE at Huntington Beach Water Department (Facility ID 20231):
   Page 5 of the HBW_ID20231_SupportingData.pdf shows the exhaust flow rate of 3761 lb/hr with exhaust temperature at 1116 F. And you assumed stack diameter of 8 in. At 1116 F, I calculated the air density to be 0.025 lb/ft^3. With the above information, I calculated the exit velocity to be:

   3761 lb/hr x 1 hr/3600s / (0.025 lb/ft^3 x π/4 x 0.667^2 ft^2) = 119 ft/s = 36.5 m/s

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2. Emissions of the plasma arc cutter at Fabrica (Facility ID 95212):
   You assumed emissions from the plasma arc cutter are limited to PM emissions. However, Chapter 12 of AP-42 shows that the plasma arc cutter could also have NOx emissions. Could you model both NOx and PM emissions from the plasma arc cutter?

Thanks.

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From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Friday, August 26, 2016 1:48 PM
To: Qian, Wenjun@Energy

Cc: Elyse.Engel@ch2m.com; Benjamin.Beattie@CH2M.com; Andrew.Dunavent@ch2m.com
Subject: HBEP Cumulative AQ Modeling

Hi Wenjun,

Below is the information you requested on the HBEP cumulative AQ impact assessment. Please let Elyse or I know if you have any additional questions and/or if you approve the cumulative impact assessment methodology.

Orange County Sanitation District (Facility ID 17301):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on November 2, 2012, May 13, 2015, and May 4, 2016.
- Source locations were not available for the three digester gas internal combustion engines (ICEs) and permitted boiler. Therefore, these modeled sources were placed at the property centroid.
- The short-term oxides of nitrogen (NO_X) emissions from the permitted boiler were modeled at 15 parts per million (ppm), based on the permit limit beginning in 2015.
- Emissions from the abrasive blasting cabinet were assumed to be limited to particulates (PM_{10}/$PM_{2.5}$). It was assumed that all particulates were less than 2.5 microns in diameter.

Huntington Beach City, Water Department (Facility ID 20231):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on May 5, 2015.
- The stack diameter was not available in the permitted source data. Therefore, a stack diameter of 8 inches was assumed, based on engineering judgment.

Fabrica (Facility ID 95212):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on July 19, 2016.
- For the plasma arc cutter:
    - The stack parameters, apart from location, were not available in the permitted source data. Therefore, a stack diameter of 4 inches and an exhaust flow of 230 cubic feet per minute[1] were taken from the specification sheet for the permitted Avani Environmental SPC-230 fume extraction unit.
    - The source is a moveable cart and was, therefore, assumed to be a ground-level source at ambient temperature.
    - Similarly, emission rates were not available in the permitted source data. Therefore, they were estimated using emission scenarios from The Swedish Institute of Production Engineering Research[2], as cited in Chapter 12 of AP-42, and a control efficiency of 99.97 percent, as provided in the specification sheet noted above.
    - Emissions from the plasma arc cutter were assumed to be limited to particulates (PM_{10}/$PM_{2.5}$). It was assumed that all particulates were less than 2.5 microns in diameter.
- For the natural gas-fired ICE generator:
    - This source is part of a cogeneration system with an existing boiler and does not operate as an emergency/standby unit. Therefore, it was conservatively assumed to operate 8,760 hours per year.
    - The source emission rates for PM_{10}/$PM_{2.5}$ and SO_2 were not available in the permitted source data. Therefore, they were estimated using Table 3.2-1 of AP-42[3] and a fuel sulfur concentration of 0.75 grains per 100 cubic

feet, respectively. A default heat content of 1,050 British thermal units per standard cubic foot was used, as necessary.

- Similarly, the stack diameter, exhaust temperature, and exhaust velocity were not available in the permitted source data. Therefore, a stack diameter of 3.5 inches, an exhaust temperature of 1,384 degrees Fahrenheit (°F), and an exhaust flow of 1,499 cubic feet per minute[1] were taken from the specification sheet for a similarly-sized (200 kilowatt) natural gas-fired ICE generator.
- The stack height was also not available in the permitted source data. Therefore, a stack height of 15 feet was assumed, based on engineering judgment.

So Cal Holding, LLC (Facility ID 169754):

- Unless otherwise noted below, source parameters and emission rates were based on permitted source data received from SCAQMD on July 2, 2014.
- The stack exhaust temperature and exhaust velocity were not available in the permitted source data. Therefore, a stack exhaust temperature of 890 °F and an exhaust flow of 7,540 cubic feet per minute[1] were taken from the specification sheet for the permitted Cummins QST30-G5 NR2 engine.
- Similarly, the stack diameter was not available in the permitted source data. Therefore, a stack diameter of 10 inches was assumed, based on engineering judgment.

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Sent: Friday, August 26, 2016 9:56 AM
To: Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>; Bemis, Gerry@Energy <Gerry.Bemis@energy.ca.gov>; Layton, Matthew@Energy <Matthew.Layton@energy.ca.gov>
Cc: Engel, Elyse/SJC <Elyse.Engel@ch2m.com>
Subject: RE: HBEP Cumulative AQ Modeling [EXTERNAL]

New and modified. The three ICEs at Orange County Sanitation District (Facility ID 17301) are modified sources.

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Sacramento, CA 95814
(916) 651–3768
Wenjun.Qian@energy.ca.gov

From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Friday, August 26, 2016 9:51 AM
To: Qian, Wenjun@Energy; Bemis, Gerry@Energy; Layton, Matthew@Energy
Cc: Elyse.Engel@ch2m.com
Subject: RE: HBEP Cumulative AQ Modeling

Hi Wenjun,

Just for the new sources being modeled?

Jerry Salamy
Principal Project Manager
CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
Office Phone: 916.286.0207
Cell Phone: 916.769.8919

From: Qian, Wenjun@Energy [mailto:Wenjun.Qian@energy.ca.gov]
Sent: Friday, August 26, 2016 9:42 AM
To: Salamy, Jerry/SAC <Jerry.Salamy@CH2M.com>; Bemis, Gerry@Energy <Gerry.Bemis@energy.ca.gov>; Layton, Matthew@Energy <Matthew.Layton@energy.ca.gov>
Cc: Engel, Elyse/SJC <Elyse.Engel@ch2m.com>
Subject: RE: HBEP Cumulative AQ Modeling [EXTERNAL]

Hi Jerry,

Matt and Gerry are not here today. I'm still reviewing the document that was docketed yesterday as well as those related thousands of pages of correspondences that were docketed earlier. If you could provide us the detailed calculations of the exhaust parameters and where the exhaust flow and emissions information were located in those thousands of pages, it will help expedite our review. I'm referring to those modified and new sources only.

Thanks.

Wenjun Qian, Ph.D., P.E.
Air Resources Engineer
California Energy Commission
1516 Ninth Street, MS-46
Sacramento, CA 95814
(916) 651–3768
Wenjun.Qian@energy.ca.gov

From: Jerry.Salamy@CH2M.com [mailto:Jerry.Salamy@CH2M.com]
Sent: Friday, August 26, 2016 9:20 AM
To: Bemis, Gerry@Energy; Qian, Wenjun@Energy
Cc: Elyse.Engel@ch2m.com
Subject: HBEP Cumulative AQ Modeling

Hi Wenjun and Gerry,

Do you have a few minutes to discuss your approval for the cumulative impact assessment source list we docketed yesterday? We would like to model over the weekend and would appreciate verbal approval before starting.

Thanks,

Jerry Salamy
Principal Project Manager
CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
Office Phone: 916.286.0207
Cell Phone: 916.769.8919

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[1] The stack exhaust flow was converted to a stack exhaust velocity based on the stack diameter.

[2] Broman B. et al, The Swedish Institute of Production Engineering Research. 1994. *Emission of Fume, Nitrogen Oxides and Noise in Plasma Cutting of Stainless and Mild Steel*. March.

[3] U.S. Environmental Protection Agency (EPA). 2000. *AP-42, Fifth Edition, Volume I*. Chapter 3: Stationary Internal Combustion Sources. Section 3.2, Natural Gas-fired Reciprocating Engines. August.

Attachment A6-2
Facilities Included in Cumulative Impact Assessment

Facility Name:	Orange County Sanitation District
Address:	10844 Ellis Avenue, Fountain Valley, CA 92708
FIND Date:	1/15/2016
Control #:	84574/70232
Miles from HBEP:	< 4 miles

								Step 2 - Source Applicability (FIND Data)		Step 3 - Source Applicability (PRR Data)			Source Information			
Application Number	Permit Number	Permit Issued Date	Permit Status	Equipment Type	Equipment Description	Application Date	Application Status	Source Included? (Yes or No)	Application Type	PRR Data Received	Source Included? (Yes or No)	Reference of Data for Analysis / Reason for Exclusion from Analysis	Source Make	Source Model	Source Size	Size Units
568969	G35620	5/13/2015	ACTIVE	Basic	ABRASIVE BLASTING (CABINET/MACHINE/ROOM)	10/9/2014	PERMIT TO OPERATE GRANTED	Yes	Permit to Operate without prior Permit to Construct	Yes	Yes	Abrasive blasting cabinet located in the Rebuild Shop at the facility. This is a new source and will be included in the cumulative analysis.	Media Blast & Abrasives	PowerPeen6060 Abrasive blasting cabinet	2	HP
546360				Basic	I C E (>500 HP) NAT & DIGESTER GAS	1/8/2013	PERMIT TO CONSTRUCT GRANTED	Yes	Alteration / Modification	Yes	Yes	Addition of control equipment (CatOX and SCR) on the digester gas system units. These sources were previously included in the cumulative modeling. Emissions and stack parameters will be modified to match the new permit limits.	Cooper Bessmer	LSVB-12-SGC	3,471	HP
546361				Basic	I C E (>500 HP) NAT & DIGESTER GAS	1/8/2013	PERMIT TO CONSTRUCT GRANTED	Yes	Alteration / Modification	Yes	Yes	Addition of control equipment (CatOX and SCR) on the digester gas system units. These sources were previously included in the cumulative modeling. Emissions and stack parameters will be modified to match the new permit limits.	Cooper Bessmer	LSVB-12-SGC	3,471	HP
546362				Basic	I C E (>500 HP) NAT & DIGESTER GAS	1/8/2013	PERMIT TO CONSTRUCT GRANTED	Yes	Alteration / Modification	Yes	Yes	Addition of control equipment (CatOX and SCR) on the digester gas system units. These sources were previously included in the cumulative modeling. Emissions and stack parameters will be modified to match the new permit limits.	Cooper Bessmer	LSVB-12-SGC	3,471	HP
494460				Basic	BOILER (5-20 MMBTU/HR) NAT & PROC GAS	12/30/2008	PERMIT TO CONSTRUCT GRANTED	Yes	Permit to Construct	Yes	Yes	Addition of boiler co-fired with natural gas and digester gas.	Hurst	S5-250-125W	10.5	MMBtu/hr

FACILITY PERMIT TO OPERATE
ORANGE COUNTY SANITATION DISTRICT

PERMIT TO OPERATE

Permit No. G35620
A/N 568969

Equipment Description:

ABRASIVE BLASTING SYSTEM WITH INTEGRAL CONTROL, CONSISTING OF:

1. BLASTING CABINET, MEDIA BLAST & ABRASIVES, INC., MODEL POWER PEEN 6060, 4'- 3" W. X 5'- 0"L. X 3'- 4" H., WITH ONE NOZZLE, MAXIMUM INSIDE DIAMETER OF 1/4", PLANT AIR SUPPLIED AT 40 PSI., AND A 1 FT3 PRESSURE POT.

2. DUST COLLECTOR, WITH A CARTRIDGE FILTER, 440 SQUARE FEET AREA, A PNEUMATIC FILTER CLEANING SYSTEM, AND A 1160 CFM, 2 H.P. BLOWER.

Conditions:

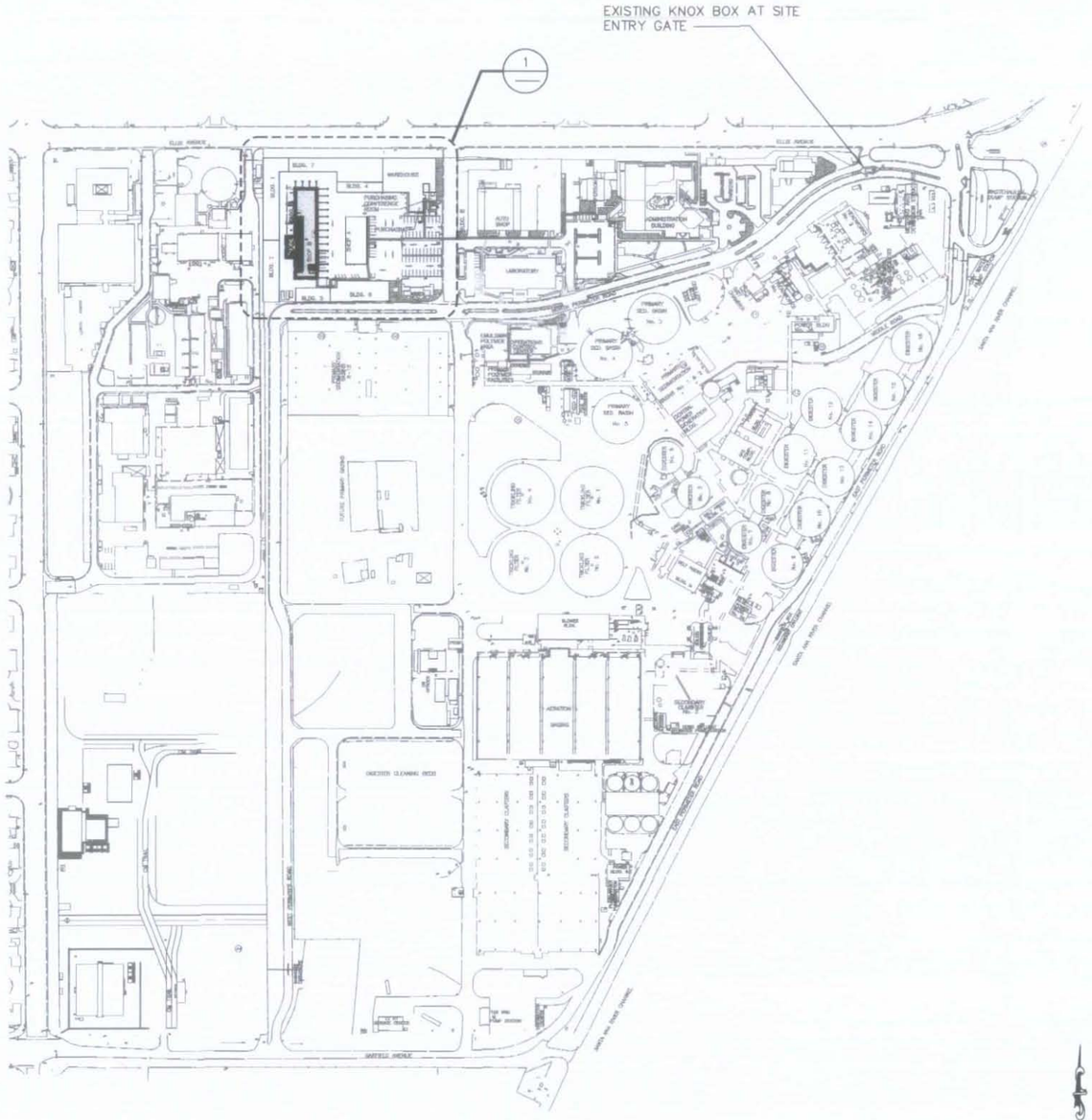
1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]

3. THIS EQUIPMENT SHALL NOT BE OPERATED UNLESS EXHAUST AIR IS VENTED THROUGH THE DUST COLLECTOR.
[RULE 1303 (a) (1) - BACT]

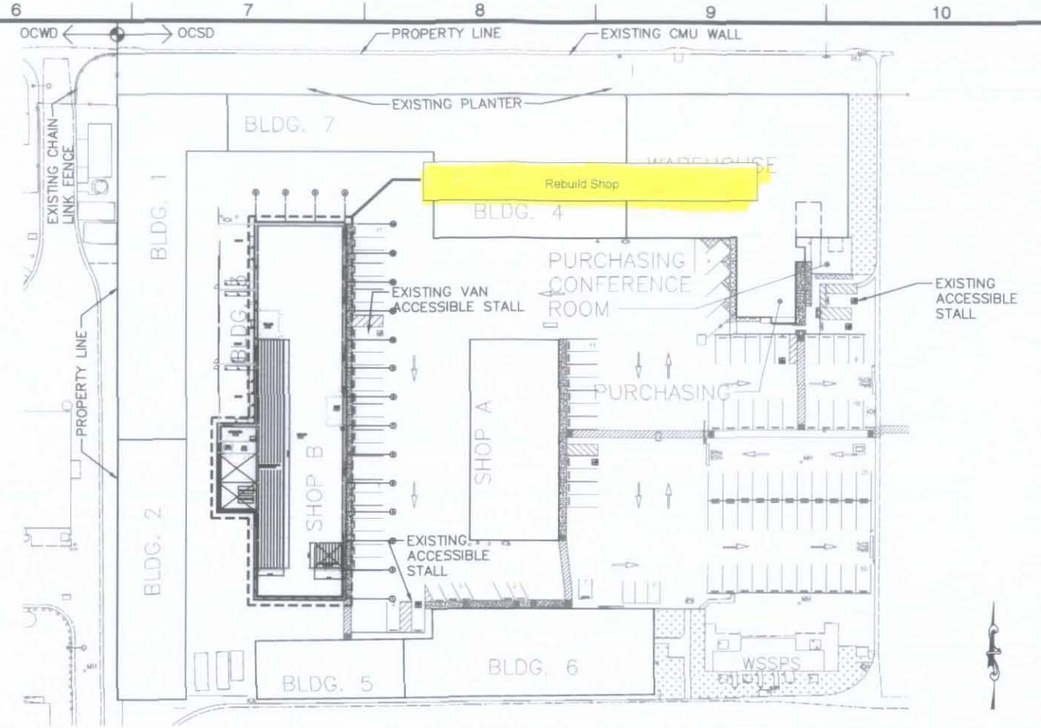
4. A DUST COLLECTOR CLEANING CYCLE GAUGE SHALL BE INSTALLED AND MONITORED TO TAKE APPROPRIATE CORRECTIVE MAINTENANCE ACTIONS PER MANUFACTURER'S OPERATOR'S MANUAL.
[RULE 204]

5. THIS EQUIPMENT SHALL BE OPERATED IN COMPLIANCE WITH RULE 1140 AND 1155.
[RULE 1140, 1155]



SITE PLAN (2)
SCALE: 1"=200'

200' 100' 0 200' 400'
SCALE : 1" = 200'-0"



TOTAL STALLS: 105
ACCESSIBLE STALLS: 5
VAN STALLS: 1

PARTIAL ENLARGED SITE PLAN (1)
SCALE: 1"=50'

50' 25' 0 50' 100'
SCALE : 1" = 50'-0"

PROJECT: ORANGE COUNTY SANITATION DISTRICT
P1-115A, PLANT 1 – SHOP B
MAINTENANCE AREA BUILDING IMPROVEMENTS
AND BUILDING H DEMOLITION

SITE LOCATION : 10884 ELLIS AVE,
FOUNTAIN VALLEY, CA 92708

GOVERNING CODES (AS AMENDED BY CITY ORDINANCE):
2010 CALIFORNIA BUILDING CODE
2010 CALIFORNIA ELECTRICAL CODE
2010 CALIFORNIA MECHANICAL CODE
2010 CALIFORNIA PLUMBING CODE
2010 CALIFORNIA FIRE CODE
2010 CALIFORNIA GREEN BUILDING CODE
AMERICAN WITH DISABILITIES ACT (ADA) STANDARDS
2008 BUILDING ENERGY STANDARDS
2010 CALIFORNIA ENERGY CODE

CONSTRUCTION TYPE: V B

OCCUPANCY GROUP: F-1 (PRIMARY) B, S-1 (INCIDENTAL)

USE: OFFICE, MANUF., STORAGE

NO. OF STORIES: 1

FIRE PROTECTION: FULLY FIRE SPRINKLED

AIR CONDITIONED: PARTIAL – SEE SAA1001 FOR AIR CONDITIONED AREAS

STORED ITEMS: SHEET METAL STOCK, FITTINGS, ANGLE IRON STOCK, MOTORS, CHAIN, SMALL PARTS CABINETS, STOCK PILE OF EXPANDED METAL SHEETS

CONFORMED DOCUMENTS FOR CONSTRUCTION

THE ADDENDA ISSUED DURING THE BIDDING PERIOD ARE INCORPORATED INTO THESE DOCUMENTS. IF DISCREPANCIES BETWEEN THESE DOCUMENTS AND THE RESPECTIVE BIDDING DOCUMENTS INCLUDING ADDENDA ARE FOUND, THE BIDDING DOCUMENTS WITH THE ORIGINAL ADDENDA SHALL GOVERN.

HAZARDOUS MATERIALS

CLASSSIFICATION	QUANTITY	ALLOWABLE
CLASS IA FLAM.	5.4 GAL.	60 GAL.
CLASS IC FLAM.	6.0 GAL.	240 GAL.
CLASS II COMB.	1.0 GAL.	220 GAL.
CLASS IIIA COMB.	7.6 GAL.	660 GAL.
CLASS IIIB COMB.	1.0 GAL.	UNLIMITED

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: SCHLESINGER,KAREN–2/25/14
DRAWN BY: ALCIVAR, JOSE–2/25/14
CHECKED BY: LOVELL, STEVE–2/25/14

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"–SCALE ACCORDINGLY)

This drawing was originally approved for construction by Steven D Lovell on 2/25/14 and sealed by Steven D Lovell a licensed professional architect in the State of California No. C13140

THE AUSTIN COMPANY
6410 OAK CANYON
IRVINE, CA 92618
949.451.9000
www.theaustin.com

ORANGE COUNTY SANITATION DISTRICT

MAINTENANCE AREA BUILDING IMPROVEMENTS AND BUILDING H DEMOLITION

SITE PLANS AND PROJECT DATA

PROJECT NO. P1–115A

DRAWING NO. SBG0004

DWG: F:\2011\11-104030 OCSD\10403 CADD\Shop B\P1-115-SBG0004.dwg USER: fred conning
DATE: Jul 31, 2014 11:53am XREFS: P1-115-BHA-XSITE01 P1-115-SBG0BDR Shop B Floor Plan

Gaurang Rawal

From: Ahn, Terry [tahn@ocsd.com]
Sent: Wednesday, October 22, 2014 7:17 AM
To: Gaurang Rawal
Subject: RE: New application for abrasive blasting cabinet
Attachments: Power Peen 6060.pdf

It is an integral part of the cabinet; therefore there's no separate baghouse. I could take a photo of the unit and send it to you if you'd like. Please let me know. Attached manufacturer's info sheet provides additional info on the dust collector. The PM control efficiency of 98% came from the AQMD form. I will have to contact the vendor to see what their number is.

Terry

From: Gaurang Rawal [mailto:grawal@aqmd.gov]
Sent: Tuesday, October 21, 2014 2:46 PM
To: Ahn, Terry
Subject: RE: New application for abrasive blasting cabinet

Is this "an integral part of the cabinet" or venting to the separate baghouse (separate application) ?
Any PM control efficiency rating? If Mgfr. spec sheet is available, will be helpful.

From: Ahn, Terry [mailto:tahn@ocsd.com]
Sent: Tuesday, October 21, 2014 2:07 PM
To: Gaurang Rawal
Subject: FW: New application for abrasive blasting cabinet

Hi Gaurang,

Here's info I got from our Maintenance. Is this what you're looking for?

Thanks,

Terry

From: Ginest, Lance
Sent: Tuesday, October 21, 2014 1:56 PM
To: Ahn, Terry
Cc: Hellebrand, Ingrid; AbuShaban, Randa
Subject: RE: New application for abrasive blasting cabinet

Terry, Here is your information.

- Type of dust collector: Is it a cartridge type? Yes If so, how many? Two
- Dimension of each cartridge 26"L X 12" D
- Material of the filter Paper
- Total filter area in sq. ft. for each cartridge 220 Sq. Ft.
- Blower HP and flow rate 2 HP/ 1,160 CFM

The unit does not have a HEPA filter. Let me know if you need anything else.

Have a great day,

South Coast Air Quality Management District

Form 400-PS

Plot Plan And Stack Information Form

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Form 400A and Form 400-CEQA.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944
Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator To Appears On The Permit): Orange County Sanitation District

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 017301

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): 10844 Ellis Avenue, Fountain Valley, CA. 92708-7018 ◉ Fixed Location ○ Various Locations

Section B - Location Data

Plot Plan

Please attach a site map for the project with distances and scales. Identify and locate the proposed equipment on the map. A copy of the appropriate Thomas Brothers page, a web-based map, or a sketch that shows the major streets and location of the equipment is acceptable.

Location of Schools Nearby

Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school? ○ Yes ◉ No

If yes, please provide name(s) of school(s) below:

School Name: _____ **School Name:** _____

School Address: _____ **School Address:** _____

Distance from stack or equipment vent to the outer boundary of the school: _____ feet

Distance from stack or equipment vent to the outer boundary of the school: _____ feet

CA Health & Safety Code 42301.9: "School" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.

Population Density

◉ Urban ○ Rural (<50% of land within 3 km radius accounted for by urban land use categories, i.e., multi-family dwelling or industrial.)

Zoning Classification

◉ Mixed Use Residential Commercial Zone (M-U) ○ Service and Professional Zone (C-S) ○ Medium Commercial (C-3)
○ Heavy Commercial (C-4) ○ Commercial Manufacturing (C-M)

Section C - Emission Release Parameters - Stacks, Vents

Stack Data

Stack Height: _____ feet (above ground level) **What is the height of the closest building nearest the stack?** _____ feet

Stack Inside Diameter: _____ inches **Stack Flow:** _____ acfm **Stack Temperature:** _____ °F

Rain Cap Present: ○ Yes ○ No **Stack Orientation:** ○ Vertical ○ Horizontal

If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack (attach additional sheet if necessary):

Building #/Name: _____ **Building #/Name:** _____

Building Height: _____ feet (above ground level) **Building Height:** _____ feet (above ground level)

Building Width: _____ feet **Building Width:** _____ feet

Building Length: _____ feet **Building Length:** _____ feet

Receptor Distance From Equipment Stack or Roof Vents/Openings

Distance to nearest residence: 820 feet **Distance to nearest business:** 125 feet

Building Information

Are the emissions released from vents and/or openings from a building? ◉ Yes ○ No

If yes, please provide:

Building #/Name: Rebuild Shop **Building Width:** 60 feet

Building Height: 30 feet (above ground level) **Building Length:** 260 feet

South Coast Air Quality Management District

Worksheet For Form 400-E-4b
Abrasive Blasting Equipment (Other Than Portable/Open)

Abrasive Flow Rate (FR)

FR_1 = 138.00
ID = 1/4
ID_1 = 1/4
ρ_1 = 156
ρ = 99

$FR = FR_1 \times (ID/ID_1) \times \rho / \rho^1$ FR = 138.000 x (0.063 in^2 ÷ 0.063 in^2) x (156 lb/ft^3 ÷ 99 lb/ft^3) = 217.455

Machine Emissions

R_1,PM = NA x _____ HP x 1- (_____/200) = _____ lb/hr x (_____ hrs/day)= _____ lb/day

Uncontrolled PM Emissions (R_1) | Max lb/hr | Max lb/day

R_2PM = R_1,PM _____ x (1-.98) = _____

Controlled PM Emissions (R_2) | Max lb/hr | Max lb/day

Room or Cabinet Emissions

R_1,PM = 0.01 EF x 217.45 FR x 1- (0.00 /200) = 2.1745 lb/hr x (2 hrs/day)= 4.3490 lb/day

Uncontrolled PM Emissions (R_1) | Max lb/hr: 2.1745 | Max lb/day: 15.2215

R_2PM = R_1,PM 2.1745 x (1-0.98) = 0.0435

Controlled PM Emissions (R_2) | Max lb/hr: 0.0435 | Max lb/day: 0.3045

Exhaust Gas Total Particulate Concentration (PC)

$$PC = \frac{0.0435 \text{ lb PM/hr (Max)} \times 7{,}000 \text{ grains/lb}}{1160.00 \text{ ft3/min} \times 60 \text{ min/hr}} = 0.00438 \text{ grains/dscf}$$

Room Cross Draft Velocity (Vc)

$V_c = VFR/W \times H$ = _____ CFM / _____ ft x _____ ft = _____ FPM

Air Inlet Port Velocity (Vi)

$V_i = VFR/W \times L$ = _____ CFM / _____ ft^2 = _____ FPM

Cabinet Air Changes Per Minute (CAC)

$CAC = VFR/W \times L \times H$ = 1160.00 CFM / 70.76 ft^3 = 16.393 FPM

Abrasive Blasting Cabinets

Item	Required	Actual	Compliance
a. Air Changes Per Minute	10-20	16.393	(•) Yes ( ) No
b. Baffled Air Inlet Ports	Yes	Yes	(•) Yes ( ) No

Abrasive Blasting Room Guidelines Review

Item	Required	Actual	Compliance
a. Crossdraft/Downdraft Velocity (FPM)			
Silica Type Abrasive	80	NA	( ) Yes ( ) No
Non-Silica Type Abrasive	50	NA	( ) Yes ( ) No
b. Air Port Opposite Exhaust Duct	Yes	NA	( ) Yes ( ) No
c. Indraft Velocity (FPM)	500	NA	( ) Yes ( ) No

South Coast Air Quality Management District

Form 400-E-4b
Abrasive Blasting Equipment (Other Than Portable/Open)

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Forms 400-A, Form 400-CEQA, and Form 400-PS.

Section C - Process Description

Blasting Type

(•) Dry Blasting ( ) Wet _____ % of time ( ) Hydro-Blasting _____ % of time

Abrasive Used

Material Type: ( ) Sand ( ) Grit ( ) Shot ( ) Plastic Media (•) Other Glass Bead

Material Name: Ballotini Impact Beads

Density: 156 lb/ft^3 Material Flow Rate (if known): _____ lbs/hour

Items To Be Blasted

Description: pupm casings and parts; valve bodies; compressor parts; bearing housings

Operating Schedule

Normal: 2 hours/day 2 days/week 27 weeks/yr

Maximum: 7 hours/day 2 days/week 12 weeks/yr

Control

Is the room vented to an external air pollution control device? ( ) Yes (•) No

If Yes, a separate application (Form 400A and E-1) needs to be filed for the control equipment.

Section D - Authorization/Signature

I hereby certify that all information contained herein and information submitted with this application is true and correct.

Preparer Info

Signature: _____ Date: 10/06/2014

Title: Regulatory Specialist Company Name: OCSD

Name: Terry Ahn

Phone #: (714) 593-7082 Fax #: (714) 593-7773

Email: tahn@ocsd.com

Contact Info

Name: Terry Ahn

Title: Regulatory Specialist Company Name: OCSD

Phone #: (714) 593-7082 Fax #: (714) 593-7773

Email: tahn@ocsd.com

THIS IS A PUBLIC DOCUMENT

Pursuant to the California Public Records Act, your permit application and any supplemental documentation are public records and may be disclosed to a third party. If you wish to claim certain limited information as exempt from disclosure because it qualifies as a trade secret, as defined in the District's Guidelines for Implementing the California Public Records Act, you must make such claim at the time of submittal to the District.

Check here if you claim that this form or its attachments contain confidential trade secret information. ☐

South Coast Air Quality Management District

Worksheet For Form 400-E-4b
Abrasive Blasting Equipment (Other Than Portable/Open)

Abrasive Flow Rate (FR)

FR1 = 138.00
ID = 1/4
ID1 = 1/4
ρ_1 = 156
ρ = 99

FR = FR1 x (ID/ID1) x ρ / ρ^1 FR = 138.000 x (0.063 in^2 ÷ 0.063 in^2) x (156 lb/ft^3 ÷ 99 lb/ft^3) = 217.455

Machine Emissions

R1,PM = NA x _____ HP x 1- (_____ /200) = _____ lb/hr x (_____ hrs/day)= _____ lb/day

Uncontrolled PM Emissions (R_1)	Max lb/hr	Max lb/day

R2PM = R1,PM _____ x (1-.98) = _____

Controlled PM Emissions (R_2)	Max lb/hr	Max lb/day

Room or Cabinet Emissions

R1,PM = 0.01 EF x 217.45 FR x 1- (0.00 /200) = 2.1745 lb/hr x (2 hrs/day)= 4.3490 lb/day

Uncontrolled PM Emissions (R_1)	Max lb/hr	Max lb/day
	2.1745	15.2215

R2PM = R1,PM 2.1745 x (1-0.98) = 0.0435

Controlled PM Emissions (R_2)	Max lb/hr	Max lb/day
	0.0435	0.3045

Exhaust Gas Total Particulate Concentration (PC)

$$PC = \frac{0.0435 \text{ lb PM/hr (Max)} \times 7{,}000 \text{ grains/lb}}{1160.00 \text{ ft3/min} \times 60 \text{ min/hr}} = 0.00438 \text{ grains/dscf}$$

Room Cross Draft Velocity (Vc)

Vc = VFR/W x H = _____ CFM / _____ ft x _____ ft = _____ FPM

Air Inlet Port Velocity (Vi)

Vi = VFR/W x L = _____ CFM / _____ ft^2 = _____ FPM

Cabinet Air Changes Per Minute (CAC)

CAC = VFR/W x L x H = 1160.00 CFM / 70.76 ft^3 = 16.393 FPM

Abrasive Blasting Cabinets

Item	Required	Actual	Compliance
a. Air Changes Per Minute	10-20	16.393	(•) Yes ( ) No
b. Baffled Air Inlet Ports	Yes	Yes	(•) Yes ( ) No

Abrasive Blasting Room Guidelines Review

Item	Required	Actual	Compliance
a. Crossdraft/Downdraft Velocity (FPM)			
Silica Type Abrasive	80	NA	( ) Yes ( ) No
Non-Silica Type Abrasive	50	NA	( ) Yes ( ) No
b. Air Port Opposite Exhaust Duct	Yes	NA	( ) Yes ( ) No
c. Indraft Velocity (FPM)	500	NA	( ) Yes ( ) No

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT	PAGES 14	PAGE 1
ENGINEERING AND COMPLIANCE DIVISION	APPL NO SEE BELOW Rvsd	DATE 01/03/2014
PERMIT APPLICATION EVALUATION AND CALCULATIONS	PROCESSED BY GCR	CHECKED BY

PERMIT TO CONSTRUCT EVALUATION

(Modifications to add DG cleaning system & addition of post-combustion controls to the CGS IC engines, POs' G2957, G2956 & G2955)

APPLICANT'S NAME: ORANGE COUNTY SANITATION DISTRICT (OCSD)

MAILING ADDRESS: 10844 ELLIS AVENUE
FOUNTAIN VALLEY, CA 92708
ATTN.: TERRY AHN, REGULATORY SPECIALIST

EQUIPMENT ADDRESS: WASTEWATER TREATMENT PLANT NO. 1
10844 ELLIS AVENUE
FOUNTAIN VALLEY, CA 92708

FACILITY ID. NO. : **17301**

CONTACT: Terry Ahn, Regulatory Specialist
Phone: (714) 593-7082 FAX: (714) 962-2591
E-mail: than@ocsd.com

EQUIPMENT DESCRIPTION:

Application No. 546360

Equipment Description:

MODIFICATIONS TO THE RESOURCE RECOVERY SYSTEM NO. 1 (G2957) CONSISTING OF:

1. INTERNAL COMBUSTION ENGINE (CG1-FV), COOPER BESSMER, SPARK IGNITION, FOUR STROKES, WITH A MODIFIED TURBOCHARGED-INTERCOOLED V-12 TYPE, MODEL NO. LSVB-12-SGC, 3471HP, NATURAL GAS AND/OR DIGESTER GAS FIRED, DRIVING A 2500 KW ELECTRIC GENERATOR, WITH AN EXHAUST HEAT RECOVERY STEAM GENERATOR, 5,008,500 BTU/HR CAPACITY, UNFIRED.

BY THE ADDITION OF;

2. DIGESTER GAS CLEANING SYSTEM (DGCS) EXPANSION, TWO VESSELS, EACH CONTAINING MINIMUM OF 9,900 LBS OF MEDIA, TOTAL 2100 CFM CAPACITY, WITH ASSOCIATED PIPING AND VALVES FOR TWO-STAGE CONFIGURATION.

   COMMON TO THREE ENGINES (CG1-FV, CG2-FV AND CG3-FV).

Application No. 546361
Equipment Description:

MODIFICATIONS TO THE RESOURCE RECOVERY SYSTEM NO. 2 (G2956) CONSISTING OF:

1. INTERNAL COMBUSTION ENGINE (CG2-FV), COOPER BESSMER, SPARK IGNITION, FOUR STROKES, WITH A MODIFIED TURBOCHARGED-INTERCOOLED V-12 TYPE, MODEL NO. LSVB-12-SGC, 3471HP, NATURAL GAS AND/OR DIGESTER GAS FIRED, DRIVING A 2500 KW ELECTRIC GENERATOR, WITH AN EXHAUST HEAT RECOVERY STEAM GENERATOR, 5,008,500 BTU/HR CAPACITY, UNFIRED.

BY THE ADDITION OF;

2. DIGESTER GAS CLEANING SYSTEM (DGCS) EXPANSION, TWO VESSELS, EACH CONTAINING MINIMUM OF 9,900 LBS OF MEDIA, TOTAL 2100 CFM CAPACITY, WITH ASSOCIATED PIPING AND VALVES FOR TWO-STAGE CONFIGURATION.

COMMON TO THREE ENGINES (CG1-FV, CG2-FV AND CG3-FV).

Application No. 546362
Equipment Description:

MODIFICATIONS TO THE RESOURCE RECOVERY SYSTEM NO. 3 (G2955) CONSISTING OF:

1. INTERNAL COMBUSTION ENGINE (CG3-FV), COOPER BESSMER, SPARK IGNITION, FOUR STROKES, WITH A MODIFIED TURBOCHARGED-INTERCOOLED V-12 TYPE, MODEL NO. LSVB-12-SGC, 3471HP, NATURAL GAS AND/OR DIGESTER GAS FIRED, DRIVING A 2500 KW ELECTRIC GENERATOR, WITH AN EXHAUST HEAT RECOVERY STEAM GENERATOR, 5,008,500 BTU/HR CAPACITY, UNFIRED.

BY THE ADDITION OF;

2. DIGESTER GAS CLEANING SYSTEM (DGCS) EXPANSION, TWO VESSELS, EACH CONTAINING MINIMUM OF 9,900 LBS OF MEDIA, TOTAL 2100 CFM CAPACITY, WITH ASSOCIATED PIPING AND VALVES FOR TWO-STAGE CONFIGURATION.

COMMON TO THREE ENGINES (CG1-FV, CG2-FV AND CG3-FV).

Conditions: (A/Ns 546360, 546361 AND 546362)

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]

emission reduction technology that employed post combustion control equipment- catalytic oxidation (to reduce CO and VOC emissions) and Selective Catalytic reduction (SCR), using aqueous urea solution injection into the engine's exhaust prior to SCR for NOx emission reduction. OCSD had made presentations about this emission reduction technology demonstrating that engine is capable of meeting Rule 1110.2 emissions limits for CO, NOx and ROG.

Based on successful results for achieving low emissions, OCSD had decided to modify existing engine's permits (3 engines at plant #1 and 5 engines at plant #2) with add-on controls in conjunction with DGCS that helps remove siloxanes present in DG. For information purpose, typical emissions reduction results for CO, NOx and VOC are listed below (Source: A & WMA, West Coast Workshop Presentation, May 16, 2013);

Pollutant	Engine Outlet Avg. ppmv	Post-combustion Emission Avg. ppmv	Rule 1110.2 Limit ppmv (Effective January 1, 2016)
CO	452	**7.5**	250
NOx	31	**7.2**	11
VOC	97	**3.6**	30

Validated data -ppmv values at 15% O2, dry @ 15% O2, 15-minute average.

Note: Proposed DGCS is common to all three engines, supplying clean DG as fuel.
DGCS, CatOx and SCR systems for both plants are identified as **OCSD Project J-111**.

Engine:
Maximum heat input rate, design = 28.5 MMBTU/HR
Exhaust (stack) flow rate = 21,222 acfm, 500 deg. F (Form 400-PS)
Exhaust Stack = 30" Diameter x 62' above ground (Form 400-PS)

Following is the brief operation for catalytic oxidizer (CatOx) and Selective Catalytic Reduction (SCR) with urea injection.

A catalytic oxidizer (CatOx) will be installed to reduce CO and VOC emissions from the engine's exhaust. CatOx, located upstream of the SCR, will be equipped with temperature and pressure monitoring devices and controls. Operating temperature range is min. 600 to max. 850 deg F. CatOx inlet and outlet samples will be taken and analyzed for speciated VOC analysis, including Formaldehyde and other TACs. For CatOx specifications please refer to the information submitted with application. The typical chemical reaction is,

$$2\ CO + O_2 \rightarrow 2\ CO_2$$

$$CH_4 + 2\ O_2 \rightarrow CO_2 + 2\ H_2O$$

Selective Catalytic Reduction (SCR) System for NOx Control

NO and NO_2 in the engine's exhaust, at high temperature, will be reduced by the Selective Catalytic Reduction (SCR) system in presence of aqueous urea injection. The Urea reagent using an injection lance, with compressed air, is injected into the center of the exhaust piping, prior to the catalyst surface. Once the exhaust gas stream reaches the proper reactive temperature for the catalyst, the reagent automatically begins to flow. Control of the proper amount of Urea reagent required is typically done by mapping of NOx reduction performance curve based on engine operating conditions or by following a programmable NOx output based on the signal from the existing CEMS.

13. THE COMBINED EMISSIONS FROM THE THREE (3) CGS ENGINES, USING CALENDAR MONTHLY EMISSIONS DIVIDED BY 30, SHALL NOT EXCEED THE FOLLOWING (UNTIL JANUARY 1, 2016):

AIR CONTAMINANT	LBS/DAY
CARBON MONOXIDE	1321
NITROGEN OXIDES (AS NO2)	368
PARTICULATES (PM10)	36
ROG OR TNMHC (AS CH4)	276
SULFUR DIOXIDE	36

[RULE 1303 (b) (2)-EMISSIONS OFFSET]

14. EFFECTIVE JANUARY 1, 2016, POST-CONTROLLED EMISSIONS FROM THIS EQUIPMENT SHALL NOT EXCEED THE FOLLOWING:

AIR CONTAMINANT	LBS/DAY
CARBON MONOXIDE	11.2
NITROGEN OXIDES (AS NO2)	11.9
PARTICULATES (PM10)	1.28
ROG OR TNMHC (AS CH4)	0.64
SULFUR DIOXIDE	0.38

[RULE 204]

15. THE OPERATOR SHALL INSTALL AND MAINTAIN A CONTINUOUS EMISSION MONITORING SYSTEM (CEMS), OR AN ALTERNATIVE SYSTEM, AS APPROVED BY THE EXECUTIVE OFFICER, TO MEASURE THE ENGINE EXHAUST FOR CO, NOx AND O2 CONCENTRATIONS ON A DRY BASIS, EXCEPT DURING SHUTDOWN FOR MAINTENANCE OF THE SYSTEM. IN ADDITION, THE CEMS SHALL CONVERT THE ACTUAL CO AND NOx TO MASS EMISSION RATES; AND RECORD THE ACTUAL AND CORRECTED ENGINE NOx CONCENTRATION AT 15% O2 AND MASS EMISSION RATES ON AN HOURLY AND DAILY BASIS.
[RULE 203, 218, RULE 1110.2]

16. WITHIN 180 DAYS AFTER INITIAL START-UP (POST MODIFICATION), AND ANNUALLY THEREAFTER (WITHIN 45 DAYS OF ANNIVERSARY OF INITIAL TEST), THE OPERATOR SHALL CONDUCT PERFORMANCE TESTS, AT MAXIMUM ACHIEVABLE LOAD, IN ACCORDANCE WITH THE APPROVED TEST PROCEDURES AND, FURNISH THE SCAQMD WRITTEN RESULTS OF SUCH PERFORMANCE TESTS WITHIN 45 DAYS AFTER TESTING. ALL SOURCE TESTING AND ANALYTICAL METHODS SHALL BE SUBMITTED FOR APPROVAL, AT LEAST 30 DAYS PRIOR TO START OF THE TESTS TO THE SCAQMD, ENERGY/PUBLIC SERVICES/WASTE MANAGEMENT/TERMINAL PERMITTING, 21865 COPLEY DRIVE, DIAMOND BAR, CA 91765. THE SUBMITTAL SHALL INCLUDE A COPY OF THE ACTIVE PERMIT. WRITTEN RESULTS OF SUCH PERFORMANCE TESTS SHALL BE SUBMITTED WITHIN 60 DAYS AFTER TESTING. NOTICE SHALL BE PROVIDED TO THE SCAQMD 10 DAYS PRIOR TO THE TESTING SO THAT AN OBSERVER MAY BE PRESENT. THE TESTS SHALL INCLUDE, BUT MAY NOT BE LIMITED TO, A TEST OF THE INLET FUEL GAS AND THE ENGINE'S EXHAUST FOR:

A. TOTAL NON-METHANE HYDROCARBONS (EXHAUST ONLY).

ORANGE COUNTY SANITATION DISTRICT

We protect public health and the environment by providing effective wastewater collection, treatment, and recycling.

March 5, 2012

Charles Tupac
Toxics and Waste Management
South Coast Air Quality Management District
21865 East Copley Drive
Diamond Bar, CA 91765

SUBJECT: Extension Request for Permit-to-Construct A/N 494460, Hurst Boiler Installation at Orange County Sanitation District (OCSD) Reclamation Plant No. 1 (Facility ID No. 017301)

In accordance with SCAQMD Rule 205, we hereby submit a written request for an extension of time to complete fabrication and construction of the new Hurst Boiler, Model S5-250-125W equipped with a low-NOx burner, Model NVC8-G-30, to be located at OCSD's Reclamation Plant No. 1 in Fountain Valley.

A number of milestones have been accomplished since the commencement of this project including completion of engineering design, grading and construction of the boiler foundation slab, installation of the pumps, and 90% construction completion of the water and gas lines. Although we have made a continued progress toward project completion, construction activities, similar to those listed below, remain to be completed thru project close-out which is planned for 2013.

- Factory demonstration testing;
- Boiler system delivery and structural installation (planned for fourth-quarter 2012);
- Electrical and instrumentation installation;
- 10% water and gas system piping and final connections; and
- Field verification testing (planned for first-quarter 2013).

Once the aforementioned structural tasks are accomplished during calendar year 2012 as presently projected, the system will undergo a series of field verification tests including functional and reliability acceptance testing, and operational readiness testing to validate performance metrics of the unit as specified.

We believe continued progress has been made on the project, and we request that the extension for the subject permit be granted thru March 15, 2013. Should you have any questions and/or comments with respect to the subject request, please contact me at (714) 593–7405 or Randa AbuShaban of our staff at (714) 593–7413.

Lisa Rothbart, P.E.
Environmental Supervisor

RA:LR:jb
\\Filer-1\ocsd\dept\eng\790\Groups\Air Quality\Letters\Rothbart\2012 PTC Extension_AN494460.doc

cc: V. Kogan T. Ahn R. AbuShaban G. Rawal (SCAQMD)

South Coast Air Quality Management District

FORM 400-PS
PLOT PLAN AND STACK INFORMATION FORM

Mail Application To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765

Tel: (909) 396-3385
www.aqmd.gov

This form must be accompanied by a completed Application for a Permit to Construct/Operate -Form 400A and Form 400-CEQA

Permit to be issued to (Business name of operator to appear on permit):
Orange County Sanitation District

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site):
10844 Ellis Avenue, Fountain Valley, CA. 92708 (◉) Fixed Location ( ) Various Locations

SECTION A: LOCATION DATA

Plot Plan
Please attach a site map for the project. Identify and locate the proposed equipment on the property. A copy of the appropriate Thomas Brothers page that shows the location, or a drawing or sketch that show the major street and identifies the location of the equipment is acceptable.

Location of School Nearby
Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school?
( ) Yes (◉) No. If yes, please provide name(s) of school(s) below.

School Name	School Address	Distance from stack or equipment vent to the outer boundary of the school.

Note: Per Section 42301.9 of the California Health and Safety Code, a "school" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in

Population Density
(◉) Urban (area of dense population) ( ) Rural (area of sparse population)

Zoning Classification
(◉) Mixed Use Residential Commercial Zone (M-U) ( ) Service and Professional Zone (C-S) ( ) Medium Commercial (C-3)
( ) Heavy Commercial (C-4) ( ) Commercial Manufacturing (C-M)

SECTION B: EMISSION RELEASE PARAMETERS -STACKS, VENTS

Stack Data
Stack Height: 42.00 feet (height above ground level)* What is the height of the closest building nearest the stack ? 30.00 feet
Stack Inside Diameter: 18.000 inches Stack Flow: 3230.00 acfm Stack Temperature: 360.00 oF
Rain Cap Present: ( ) Yes (◉) No Stack Orientation: (◉) Vertical ( ) Horizontal
* If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack(attach additional sheet if necessary

Building #/name:	Building #/name:
Digester No. 8	Digester No. 11
Building Height: 30.00 feet	Building Height: 30.00 feet
Building Width: 90.00 feet	Building Width: 110.00 feet
Building Length: 90.00 feet	Building Length: 110.00 feet

Receptor Distance from equipment stack or roof vents/openings
Distance to nearest residence 700.00 feet or 213 meters | Distance to nearest business 1100.0 feet or 335 meters

Building Information
Are the emissions released from vents and/or openings from the building? ( ) Yes (◉) No
If yes, please provide:
Building height above ground level: ____ ft. | Building dimensions: ____ length ft. x ____ width ft. or ____ Total square footage of building where the source of the emissions is located.

SECTION C: APPLICANT CERTIFICATION STATEMENT

I hereby certify that all information contained herein and information submitted with this application is true and correct.

SIGNATURE OF PREPARER:	TITLE OF PREPARER:	PREPARER'S TELEPHONE NUMBER: (714) 593-7082
	Regulatory Specialist	PREPARER'S E-MAIL ADDRESS: tahn@ocsd.com

CONTACT PERSON FOR INFORMATION ON THIS EQUIPMENT:	CONTACT PERSON'S	DATE SIGNED:
Terry Ahn	TELEPHONE NUMBER: (714) 593-7082	12/15/08
E-MAIL ADDRESS: tahn@ocsd.com	FAX NUMBER: (714) 962-8379	

CONFIDENTIAL INFORMATION
Under the California Public Records Act, all information in your permit application will be considered a matter of public record and may be disclosed to a third party. If you wish to keep certain items as confidential, please complete the following steps:
(a) Make a copy of any page containing confidential information blanked out. Label this page "public copy."
(b) Label the original page "confidential." Circle all confidential items on the page.
(c) Prepare a written justification for the confidentiality of each confidential item. Append this to the confidential copy.

ORANGE COUNTY SANITATION DISTRICT

10844 Ellis Avenue
Fountain Valley, CA
92708-7018

Mailing Address
P.O. Box 8127
Fountain Valley, CA
92728-8127

www.ocsd.com

Phone
(714) 962-2411

Fax
) 962-0356

December 16, 2008

Permit Services
South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

Subject: Permit Application for Installation of Low NOx Hot Water Boiler at OCSD's Plant No. 1 (OCSD Job NO. P1-100)

The purpose of this letter is to submit a permit application for the installation of a new low NOx hot water boiler at Orange County Sanitation District's Wastewater Treatment Plant No. 1. The new boiler will provide additional heating capacity for the existing anaerobic sludge digestion system.

The new boiler will have maximum rated heat capacity of 10.5 million Btu per hour and be designed to operate with the digester gas as the primary fuel and natural gas as the secondary fuel. The boiler emission controls will be designed for NOx concentration of 15 ppmv and 9 ppmv when fueled with OK digester gas and natural gas, respectively.

Enclosed with this letter are:

- SCAQMD Form 400-A
- SCAQMD Form 400-CEQA
- SCAQMD Form 400-E-9a
- SCAQMD Form 400-PS
- Supplemental Information
- Check for the permit processing fee in the amount of $12,939.58

If you have any questions or require further information, please contact Terry Ahn at (714) 593-7082 or tahn@ocsd.com.

Michael D. Moore
Manager Environmental Compliance and Regulatory Affairs

FACILITY PERMIT TO OPERATE
ORANGE COUNTY SANITATION DISTRICT

TOTAL NON-METHANE ORGANICS (EXHAUST & INLET DIGESTER GAS)
SPECIATED TRACE ORGANICS (EXHAUST, DIGESTER GAS)
TOTAL PARTICULATES (EXHAUST)
OXIDES OF NITROGEN (EXHAUST)
CARBON MONOXIDE (EXHAUST)
OXYGEN
DIGESTER GAS BTU (HHV), AND TOTAL SULFUR CONTENT (AS H2S, PPMV)

THE REPORT SHALL PRESENT THE EMISSIONS DATA IN PARTS PER MILLION (PPMV) ON A DRY BASIS, POUNDS PER HOUR, AND LBS/MMBTU.
[RULE 217, RULE 404, RULE 1146, RULE 1303(A) (1), 1303 (B) (1), 1303(B) (2) - BACT, MODELING AND OFFSET, 1401]

10. MONITORING AND TESTING OF THE BOILER SHALL BE PERFORMED ACCORDING TO RULE 1146.
[RULE 1146]

11. EMISSIONS RESULTING FROM THIS EQUIPMENT SHALL NOT EXCEED THE FOLLOWING:

POLLUTANT	POUNDS PER HOUR
CO	0.90 (0.43 WITH NATURAL GAS)
NOx	0.44 (0.17 WITH NATURAL GAS)
PM10	0.056
ROG	0.083
SOx	0.13

[RULE 404, 431.1, 1303(a) (1)-BACT, 1303(b) (2) - OFFSET]

12. THIS EQUIPMENT SHALL BE OPERATED IN COMPLIANCE WITH APPLICABLE REQUIREMENTS OF 40 CFR 63 SUBPART DDDDD.
[40 CFR 63 SUBPART DDDDD]

13. ALL RECORDS REQUIRED BY THIS PERMIT SHALL BE KEPT AND MAINTAINED FOR A MINIMUM OF FIVE YEARS AND SHALL BE MADE AVAILABLE TO AQMD PERSONNEL UPON REQUEST.
[RULE 3004 (a) (1)]

Periodic Monitoring:

14. THE OPERATOR SHALL DETERMINE COMPLIANCE WITH THE EMISSION LIMIT(S) IN CONDITION NO. 11, AT LEAST ONCE EVERY FIVE YEARS USING AQMD-APPROVED TEST METHOD. THE TEST SHALL BE CONDUCTED WHEN THE EQUIPMENT IS OPERATING UNDER NORMAL CONDITIONS. THE OPERATOR SHALL COMPLY WIT H ALL GENERAL TESTING, REPORTING, AND RECORDKEEPING REQUIREMENTS IN SECTIONS E AND K OF THIS PERMIT.
[RULE 1303 – OFFSET, 3004 (a) (4)]

South Coast Air Quality Management District

FORM 400-E-9
Engineer Report

Data	A/N:

GIVEN

RATING: 10,500,000 btu/hr.

HHV: 600 btu/cu. ft.

FUEL USAGE:

17500 cu.ft./hr.

420000 cu.ft./day

12600 cu.ft./mo.

OPERATING SCHEDULE:

24 hrs./day

7 days/wk.

30 days/mo.

52 wks./yr.

364 dys./yr.

DG?

Calculations

	EF lbs/mmcf	EF lb./mmbtu	HOURLY lbs./hr.	DAILY lbs./day	30 DAY AVE. lbs./day	30 DAY NSR lbs./day	ANNUAL lbs./yr.
ROG	7	0.0122	0.1281	3.0744	3.1062	3	1119.0816
NOx	30 ✓	0.0349	0.3665	8.7960	8.8869 ✓	9	3201.7440
SOx	40 ppm	0.0628	0.6594	15.8256	15.9891	16	5760.5184
CO	100 ppm	0.0708	0.7434	17.8416	18.0260	18	6494.3424
PM	7.5	0.0130	0.1365	3.2760	3.3099	3	1192.4640
PM10	7.5	0.0130	0.1365	3.2760	3.3099	3	1192.4640

Facility Name:	Orange County Sanitation District
Address:	22212 Brookhurst Street, Huntington Beach, CA 92646
FIND Date:	1/15/2016
Control #:	70234
Miles from HBEP:	< 1 mile

								Step 2 - Source Applicability (FIND Data)		Step 3 - Source Applicability (PRR Data)			Source Information			
Application Number	Permit Number	Permit Issued Date	Permit Status	Equipment Type	Equipment Description	Application Date	Application Status	Source Included? (Yes or No)	Application Type	PRR Data Received	Source Included? (Yes or No)	Reference of Data for Analysis / Reason for Exclusion from Analysis	Source Make	Source Model	Source Size	Size Units
474766	F95584	2/27/2008	ACTIVE	Basic	I C E (>500 HP) NAT & DIGESTER GAS	10/19/2007	PERMIT TO CONSTRUCT GRANTED	Yes	Alteration / Modification	Yes	Yes	Increase in annual operating hours from 20 to 50. No change to short-term operation.	Caterpillar	Model No. 3512	1,482	HP
474767	F95585	2/27/2008	ACTIVE	Basic	I C E (>500 HP) NAT & DIGESTER GAS	10/19/2007	PERMIT TO OPERATE GRANTED	Yes	Alteration / Modification	Yes	Yes	Increase in annual operating hours from 20 to 50. No change to short-term operation.	Caterpillar	Model No. 3512	1,482	HP
474768	F95586	2/27/2008	ACTIVE	Basic	I C E (>500 HP) NAT & DIGESTER GAS	10/19/2007	PERMIT TO OPERATE GRANTED	Yes	Alteration / Modification	Yes	Yes	Increase in annual operating hours from 20 to 50. No change to short-term operation.	Caterpillar	Model No. 3512	1,482	HP
474769	F95587	2/27/2008	ACTIVE	Basic	I C E (>500 HP) NAT & DIGESTER GAS	10/19/2007	PERMIT TO OPERATE GRANTED	Yes	Alteration / Modification	Yes	Yes	Increase in annual operating hours from 20 to 50. No change to short-term operation.	Caterpillar	Model No. 3512	1,482	HP
474770	F95588	2/27/2008	ACTIVE	Basic	I C E (>500 HP) NAT & DIGESTER GAS	10/19/2007	PERMIT TO OPERATE GRANTED	Yes	Alteration / Modification	Yes	Yes	Increase in annual operating hours from 20 to 50. No change to short-term operation.	Caterpillar	Model No. 3512	1,482	HP
455673	F81556	4/12/2006	ACTIVE	Basic	I C E (50-500 HP) EM ELEC GEN-DIESEL	4/12/2006	PERMIT TO OPERATE GRANTED	Yes	Permit to Operate	Yes	Yes	New emergency diesel ICE.	Detroit Diesel	Model No. T1637M36	2,936	BHP
455671	F81555	4/12/2006	ACTIVE	Basic	I C E (50-500 HP) EM ELEC GEN-DIESEL	4/12/2006	PERMIT TO OPERATE GRANTED	Yes	Permit to Operate	Yes	Yes	New emergency diesel ICE.	Detroit Diesel	Model No. T1637M36	2,936	BHP
455670	F81554	4/12/2006	ACTIVE	Basic	I C E (50-500 HP) EM ELEC GEN-DIESEL	4/12/2006	PERMIT TO OPERATE GRANTED	Yes	Permit to Operate	Yes	Yes	New emergency diesel ICE.	Detroit Diesel	Model no. T1637M36	2,936	BHP

From: Gaurang Rawal
To: Storelli, Elizabeth/SAC
Subject: RE: Stack Parameters data request - follow-up email
Date: Thursday, January 03, 2013 10:07:25 AM

Good Morning, Beth, and wish you a Happy and Prosperous New Year.

Yes, the engines listed below (also known as CGS by OC- Central Generation System) have been permitted since 1995. There are only 5 such identical engines at the site. Over the years, each engine's permit may have been revised for various reasons (e.g. alteration/modification, change of permit conditions, compliance with new rule emissions limits, administrative change, etc), there by new permit issued under a new application and permit # .

Hope, this answers your questions. If you have any questions, pl call me.

Gaurang Rawal
(909) 396-2543

From: Elizabeth.Storelli@ch2m.com [mailto:Elizabeth.Storelli@ch2m.com]
Sent: Thursday, January 03, 2013 9:44 AM
To: Gaurang Rawal
Subject: RE: Stack Parameters data request - follow-up email

Good Morning Guarang,

I hope you had a nice holiday! I have a few follow-up questions to some of the information you provided in our correspondence below back in November.

For the OC Sanitation District Facility ID# 29110:

1. Can you please confirm that there are only 5 engines (ICE [>500 HP] NAT & DIGESTER GAS) at the facility?
2. Can you please confirm that these 5 engines were originally permitted in 1995?

Reasoning behind our questions:

In reviewing information in SCAQMD FIND, there are 10 applications for ICEs (app #'s 480908, 909, 911, 912 & 916 AND more recently: 540708 through 540712). We are assuming that the 5 most current applications (#'s: 540708 through 540712) are just modifications to the already existing engines. Can you please confirm this assumption.

Secondly, we believe that the 5 engines were permitted back in 1995 based on our review of their permits we received through SCAQMD Public Data Request process. Can you please confirm this as well. The date they were permitted is important criteria for whether or not we include them in our modeling.

Please feel free to call me if you have any questions,

Beth Storelli

CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
Office 916.286.0259
elizabeth.storelli@ch2m.com

From: Gaurang Rawal [mailto:grawal@aqmd.gov]
Sent: Thursday, November 29, 2012 9:03 AM
To: Storelli, Elizabeth/SAC
Subject: FW: Stack Parameters data request - follow-up email

Hi Beth,

Attached is the requested info.
One plant (ID 17301) has 3-identical engines and the other plant (ID 29110) has five identical engines.
Hope, this information will be helpful.

Regards,

Gaurang Rawal

From: Ahn, Terry [mailto:tahn@ocsd.com]
Sent: Thursday, November 29, 2012 8:52 AM
To: Gaurang Rawal
Cc: Kogan, Vlad
Subject: RE: Stack Parameters data request - follow-up email

Hi Gaurang,

The data in the attached file comes from the AB2588 HRA reports we submitted to SCAQMD in 2008.

If you need anything else please let me know.

Terry

From: Gaurang Rawal [mailto:grawal@aqmd.gov]
Sent: Thursday, November 29, 2012 8:36 AM
To: Ahn, Terry
Subject: FW: Stack Parameters data request - follow-up email

Terry,

Just a follow up to our conversation this morning. Below is the requested info. Thanks for your prompt attention and assistance.

Gaurang
9909) 396-2543

From: Elizabeth.Storelli@ch2m.com [mailto:Elizabeth.Storelli@ch2m.com]
Sent: Wednesday, November 28, 2012 4:46 PM
To: Gaurang Rawal
Subject: Stack Parameters data request - follow-up email

Hi Gaurang,

Thank you for speaking with me this evening. As I mentioned, we are working on a cumulative air quality analyses on the area surrounding our client's project site in Huntington Beach. We have gone through SCAQMD's FIND database as well as submitted and received information through your Public Records Request process.

We have a few outstanding pieces of information that we still need regarding facilities that you are the engineer on. Can you please provide us with the following infomration:

1. Orange County Sanitation District Facility (ID: 17301): Can you please provide the stack parameters (height(ft), diameter(ft), temp(F), velocity(FPs)) for dispersion modeling for the following Application #s: 486760, 486792, 486793
2. Orange County Sanitation District Facility District Facility (ID: 29110) Can you please provide the stack parameters (height(ft), diameter(ft), temp(F), velocity(FPs)) for dispersion modeling for the following Application #: 480908

Please feel free to call if you have any additional questions.

Thank you,

Beth Storelli

CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
Office 916.286.0259
elizabeth.storelli@ch2m.com

OCSD CGS Engines Source Parameters

POINT SOURCES	Stack Height		Exhaust Temperature		Exhaust Flow rate		Exhaust Velocity		Stack Diameter	
	(feet)	(m)	(°F)	(°K)	(ft^3/min)	(m^3/sec)	(ft/min)	(m/s)	(feet)	(m)
3 CGS Engines - Facility ID. 017301	62.0	18.90	500.0	533.2	17,274.0	8.2	3519.03	17.88	2.5	0.76
5 CGS Engines - Facility ID. 029110	59.0	17.98	600.0	588.71	22088.43	10.42	4499.82	22.86	2.5	0.76

FACILITY PERMIT TO OPERATE
ORANGE COUNTY SANITATION DISTRICT

PERMIT TO OPERATE

Permit No. F95584
A/N 474766

Equipment Description:

INTERNAL COMBUSTION ENGINE, NO. 2, AT PB-C, CATERPILLAR, COMPRESSION-IGNITION, FOUR STROKE, TURBOCHARGED-AFTERCOOLED, V-12 TYPE, MODEL NO. 3512, SERIAL NUMBER 24Z01547, 1482 HP, DIESEL OIL-FIRED, DRIVING A 1000 KW EMERGENCY ELECTRICAL GENERATOR.

Conditions:

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
[RULE 204]

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
[RULE 204]

3. THIS ENGINE SHALL NOT BE OPERATED MORE THAN 200 HOURS IN ANY ONE YEAR WHICH INCLUDES NOT MORE THAN 30 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING PURPOSES.
[RULE 1304(a), RULE 1110.2, RULE 1470]

4. AN OPERATIONAL NON-RESETTABLE TOTALIZING TIME METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
[RULE 1304(a), RULE 1110.2, RULE 1470]

5. THE OPERATION OF ENGINE BEYOND THE 30 HOURS PER YEAR ALLOTTED FOR ENGINE MAINTENANCE AND TESTING SHALL BE ALLOWED ONLY IN THE EVENT OF A LOSS OF GRID POWER OR UP TO 30 MINUTES PRIOR TO A ROTATING OUTAGE, PROVIDED THAT THE ELECTRICAL GRID OPERATOR OR ELECTRIC UTILITY HAS ORDERED ROTATING OUTAGES IN THE CONTROL AREA WHERE THE ENGINE IS LOCATED OR HAS INDICATED THAT IT EXPECTS TO ISSUE SUCH AN ORDER AT A CERTAIN TIME, AND THE ENGINE IS LOCATED IN A UTILITY SERVICE BLOCK THAT IS SUBJECT TO THE ROTATING OUTAGE. ENGINE OPERATION SHALL BE TERMINATED IMMEDIATELY AFTER THE UTILITY DISTRIBUTION COMPANY ADVISES THAT A ROTATING OUTAGE IS NO LONGER IMMINENT OR IN EFFECT.
[RULE 1304 (a) (1)-BACT, RULE 1470]

6. THIS ENGINE SHALL NOT BE USED AS PART OF A DEMAND RESPONSE PROGRAM USING INTERRUPTIBLE SERVICE CONTRACT IN WHICH A FACILITY RECEIVES A PAYMENT OR REDUCED RATES IN RETURN FOR REDUCING ITS ELECTRIC LOAD ON THE GRID WHEN REQUESTED TO SO BY THE UTILITY OR THE GRID OPERATOR.
[RULE 1303 (a) (1)-BACT, RULE 1470]

NSR DATA SUMMARY SHEET

Application No: 474766
Application Type: Change of Conditions
Application Status: PROCESSING
Previous Apps,Dev,Permit #: 134617, 0 - ICE-PPS, NONE

Company Name: ORANGE COUNTY SANITATION DISTRICT
Company ID: 29110
Address: 22212 BROOKHURST ST,HUNTINGTON BEACH, CA
RECLAIM: NO
RECLAIM Zone: 01
Air Basin: SC
[redacted]e: 18
Title V: NO

Device ID: 0 - ICE-PPS
Estimated Completion Date: 12-30-2007
Heat Input Capacity: 0 Million BTU/hr
Priority Reserve: NONE - No Priority Access Requested
Recommended Disposition: 31 - PERMIT TO OPERATE GRANTED
PR Expiration:
School Within 1000 Feet: NO
Operating Weeks Per Year: 50
Operating Days Per Week: 1
Monday Operating Hours: 00:00 to 01:00
Tuesday Operating Hours: 00:00 to 00:00
Wednesday Operating Hours: 00:00 to 00:00
Thursday Operating Hours: 00:00 to 00:00
Friday Operating Hours: 00:00 to 00:00
[redacted]urday Operating Hours: 00:00 to 00:00
Sunday Operating Hours: 00:00 to 00:00

Emittant: CO
BACT:
Cost Effectiveness: NO
Source Type: MAJOR
Emis Increase: 0
Modeling: N/A
Public Notice: N/A
CONTROLLED EMISSION
Max Hourly: 9.81 lbs/hr
Max Daily: 9.81 lbs/day
UNCONTROLLED EMISSION
Max Hourly: 9.81 lbs/hr
Max Daily: 39.24 lbs/day
CURRENT EMISSION
BACT 30 days Avg: 1 lbs/day
Annual Emission: 490.5 lbs/yr
District Exemption: 1304(a)(4)-10/12/1995-Emergency Equipment attainment

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Emittant: NOX
BACT:
Cost Effectiveness: NO
Source Type: MAJOR
Emis Increase: 0
Modeling: N/A
Public Notice: N/A
CONTROLLED EMISSION
Max Hourly: 45.32 lbs/hr
Max Daily: 45.32 lbs/day
UNCONTROLLED EMISSION
Max Hourly: 45.32 lbs/hr
Max Daily: 181.28 lbs/day
CURRENT EMISSION
BACT 30 days Avg: 7 lbs/day
Annual Emission: 2266 lbs/yr
District Exemption: 1304(a)(4)-10/12/1995-Emergency Equipment

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Emittant: PM10
BACT:
Cost Effectiveness: NO
Source Type: MINOR
Emis Increase: 0
Modeling: N/A
Public Notice: N/A
CONTROLLED EMISSION
Max Hourly: 0.82 lbs/hr
Max Daily: 3.28 lbs/day
UNCONTROLLED EMISSION
Max Hourly: 0.82 lbs/hr
Max Daily: 3.28 lbs/day
CURRENT EMISSION
BACT 30 days Avg: 0 lbs/day
Annual Emission: 164 lbs/yr
District Exemption: None

SCEC

ORANGE COUNTY SANITATION DISTRICT PLANT NO. 2 EMERGENCY DIESEL GENERATORS 2004 ENGINEERING SOURCE TEST REPORT

PREPARED FOR:
Orange County Sanitation District
Post Office Box 8127
10844 Ellis Avenue
Fountain Valley, California 92728-8127

EQUIPMENT LOCATION:
Plant No. 2
Internal Combustion Engine Emergency Diesel-Fired Generators
Huntington Beach Wastewater Treatment Facility
Huntington Beach, California

TEST DATES:
June 15-17, 2004

ISSUE DATE:
July 15, 2004

PREPARED BY:
Mr. Michael W. Bell
SCEC
1582-1 North Batavia Street
Orange, California 92867

Report No: 2061.1014.rpt1

Tested By: Michael W. Bell
Michael W. Bell

Reviewed By: for
Leslie A. Johnson

TABLE 1.1
SUMMARY OF RESULTS

Parameter	Units	CAT 3512	DD 9163-7305	DD T163-7K16
Stack Heigh: Above Ground Level [1]	Ft	24.292	32.958	27.833
Stack Inside Diameter	In	11.75	12.875	15.25
Stack Flow Rate	ACFM	5,030	6,920	9,381
Stack Flow Rate @ 68 deg F, 29.92 in Hg	DSCFM	1,886	3,600	4,332
Stack Temp	Deg F	843	502	597
Stack Moisture Content	% Vol	7.4	4.7	7.0
Test Load	KW	440	386	1150
Horsepower (Rated @ Full Load)	BHP	1482	1515	2935
Horsepower (Estimated Actual Based on KW Output) [2] 44%	BHP	652	547	1688
PM Concentration [3]	gr/DSCF	0.0224	0.0169	0.0103
PM Mass Emissions [3]	Lb/Hr	0.36	0.52	0.38
PM Mass Emissions (Based on Rated BHP) [3]	Gm/BHP-Hr	0.111	0.156	0.103
PM Mass Emissions (Based on Estimated Actual BHP) [3]	Gm/BHP-Hr	0.252	0.434	0.059
O_2 Concentration	% vd	11.59	16.40	12.30
CO_2 Concentration	% vd	6.88	3.38	6.36
NO_x Concentration	ppmvd	1727	550	1356
NO_x Mass Emissions	Lb/Hr	23.33	14.18	42.08
NO_x Mass Emissions (Based on Rated BHP)	Gm/BHP-Hr	7.142	4.247	6.504
NO_x Mass Emissions (Based on Estimated Actual BHP)	Gm/BHP-Hr	16.233	11.762	11.308
CO Concentration	ppmvd	242	105	79
CO Mass Emissions	Lb/Hr	1.99	1.65	1.49
CO Mass Emissions (Based on Rated BHP)	Gm/BHP-Hr	0.609	0.493	0.231
CO Mass Emissions (Based on Estimated Actual BHP)	Gm/BHP-Hr	1.384	1.367	0.401
TGNMEO Concentration	ppmv	83.5	96.6	79.5
TGNMEO Mass Emissions	Lb/Hr	0.39	0.87	0.86
TGNMEO Mass Emissions (Based on Rated BHP)	Gm/BHP-Hr	0.120	0.259	0.133
TGNMEO Mass Emissions (Based on Estimated Actual BHP)	Gm/BHP-Hr	0.273	0.718	0.231

[1] Height was measured as best as possible; however ground level was sloped for CAT 3512 and DD 9163-7305 buildings.

[2] Horsepower is estimated based on calculated efficiency of full load generator to horsepower rating. Manufacturer curves should be utilized to more accurately determine horsepower at the test load.

[3] PM data is for the front-half (probe, nozzle and filter components). Additional PM data for the condensable fraction is provided in Appendix A.

Emittant: CO
BACT:
Cost Effectiveness: NO
Source Type: MAJOR
Emis Increase: 0
Modeling: N/A
Public Notice: N/A
CONTROLLED EMISSION
Max Hourly: 6.03 lbs/hr
Max Daily: 6.03 lbs/day
UNCONTROLLED EMISSION
Max Hourly: 6.03 lbs/hr
Max Daily: 24.12 lbs/day
CURRENT EMISSION
BACT 30 days Avg: 1 lbs/day
Annual Emission: 301.5 lbs/yr
District Exemption: None

Emittant: NOX
BACT:
Cost Effectiveness: NO
Source Type: MAJOR
Emis Increase: 0
Modeling: N/A
Public Notice: N/A
CONTROLLED EMISSION
Max Hourly: 46.74 lbs/hr
Max Daily: 46.74 lbs/day
UNCONTROLLED EMISSION
Max Hourly: 46.74 lbs/hr
Max Daily: 186.96 lbs/day
CURRENT EMISSION
BACT 30 days Avg: 7 lbs/day
Annual Emission: 2337 lbs/yr
District Exemption: None

Emittant: PM10
BACT:
Cost Effectiveness: NO
Source Type: MINOR
Emis Increase: 0
Modeling: N/A
Public Notice: N/A
CONTROLLED EMISSION
Max Hourly: 0.64 lbs/hr
Max Daily: 0.64 lbs/day
UNCONTROLLED EMISSION
Max Hourly: 0.64 lbs/hr
Max Daily: 2.56 lbs/day
CURRENT EMISSION
BACT 30 days Avg: 0 lbs/day
Annual Emission: 32 lbs/yr
District Exemption: None

From: David De Boer
To: Storelli, Elizabeth/SAC
Subject: RE: CH2M HIll - additional data request
Date: Thursday, November 29, 2012 5:25:54 PM
Attachments: ENG - Application Folder - 8-20-2010 - Fac ID; 101173 - Appl# 416969 - Permit# - Name; DETROIT DIESEL CORPORATIO.pdf

Hi Beth,

This attached should cover the three applications in question.

Sincerely,

David De Boer
Program Supervisor
Planning, Rule Development & Area Sources
Phone: (909) 396-2329
Fax: (909) 396-3306

From: Elizabeth.Storelli@ch2m.com [mailto:Elizabeth.Storelli@ch2m.com]
Sent: Thursday, November 29, 2012 4:31 PM
To: David De Boer
Subject: CH2M HIll - additional data request

Hi Dave,

Thank you for speaking with me this evening. As I mentioned, we are working on a cumulative air quality analyses on the area surrounding our client's project site in Huntington Beach.

Attached is our original Public Records Request. We did receive the 'ENG Application Folder' for the Appl #'s listed below, but they did not contain some information that we still need. Our Control # was 70234.

Therefore, can you please provide us with the following information for Orange County Sanitation District Facility District Facility (ID: 29110) Application #s: 455673, 455671, 455670:

- Stack parameters (height(ft), diameter(ft), temp(F), velocity(FPs))
- Emissions Data

For clarity, I inserted the table we are trying to populate:

			Stack Parameters				Emissions (lb/hr)					Annual Emissions (tpy)		
Application Number	Permit Number	Equipment Description	Stack Ht (ft)	Diameter (ft)	Temp (F)	Velocity (FPs)	Nox	CO	SO2	PM10	PM2.5	Nox	PM10	PM2.5
455673	F81556	I C E (50-500 HP) EM ELEC GEN-DIESEL												
455671	F81555	I C E (50-500 HP) EM ELEC GEN-DIESEL												
455670	F81554	I C E (50-500 HP) EM ELEC GEN-DIESEL												

Please feel free to call if you have any additional questions.

Thank you,

Beth Storelli

CH2M HILL
2485 Natomas Park Drive, Suite 600
Sacramento, CA 95833
Office 916.286.0259
elizabeth.storelli@ch2m.com

SOx:
- Compliance with sulfur content limit of 0.05% by weight is expected and will be a required permit condition.

Rule 1401: This equipment is exempted from requirements of this rule as per (g)(1)(F).

EPA Grant 105 - Operating on a standby basis, emissions from these engines will not exceed the emissions specified in the Grant 105 Memorandum dated 2-16-84.

DISCUSSION

It has been determined that the equipment will operate in compliance with all the applicable Rules and Regulations of the District.

RECOMMENDATION

Approve manufacturer's certification subject to the following permit conditions:

PERMIT CONDITIONS

Manufacturer Condition

1. THIS CERTIFIED EQUIPMENT PERMIT FOR THIS EQUIPMENT SHALL NOT RELIEVE THE PERSON CONSTRUCTING, INSTALLING OR OPERATING THE EQUIPMENT AT EACH SPECIFIC SITE FROM THE REQUIREMENT TO OBTAIN ALL NECESSARY PERMIT(S) TO CONSTRUCT AND PERMIT(S) TO OPERATE OR, FROM COMPLIANCE WITH ANY OTHER DISTRICT RULES INCLUDING THE REQUIREMENTS OF REGULATION XIII.

End User Conditions

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THIS APPLICATION UNDER WHICH A PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

3. A TIMER SHALL BE MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.

4. AN ENGINE OPERATING LOG LISTING THE DATE OF OPERATION, THE ELAPSED TIME, IN HOURS, AND THE REASON FOR OPERATION SHALL BE KEPT AND MAINTAINED ON FILE FOR A MINIMUM OF TWO YEARS AND MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

Application# 419969
Detriot Diesel-Model T1637M36
EPA Certified-DDX-NR9-03-02
Engine Family-3DDXL65.0GTP
2936 BPH/2190 Kw
16cyl, Diesel fuel, T/A

Engine rating (BHP)	2936
Max. Daily operation (Hrs)	3.5
Max. Month Operation (Hrs)	5.5
Average Yearly Operation (Hrs)	29

		RHC	NOX	SOx	CO	PM
E.F. (g/BHP-hr		1	6.9	0.184	8.5	0.4
g/hr		2936.0	20258.4	540.22	24956.0	1174
lbs/hr		6.47	44.66	1.19	55.02	2.59
lbs/day-Distributor's Location (30 day avg)*		0	0	0	0	0
lbs/yr-Distributors Location*		0	0	0	0	0
**To be debited to end user's location*						

End User Emission Increases		RHC	NOX	SOx	CO	PM
Gms/hr		2936.0	20258.4	540.2	24956.0	1174.4
Lbs/hr		6.47	44.66	1.19	55.02	2.59
Lbs/day (max)		23	156	4	193	9
Lbs/day (30 day average)		1	8	0	10	0
Lbs/yr		188	1295	35	1596	75

Facility Name:	Arlon Graphics, LLC
Address:	2811 South Harbor Blvd, Santa Ana, CA 92704
FIND Date:	9/19/2012
Control #:	70237
Miles from HBEP:	< 6 miles

Application Number	Permit Number	Permit Issued Date	Permit Status	Equipment Type	Equipment Description	Application Date	Application Status	Step 2 - Source Applicability (FIND Data)		Step 3 - Source Applicability (PRR Data)			Source Information			
								Source Included? (Yes or No)	Application Type	PRR Data Received	Source Included? (Yes or No)	Reference of Data for Analysis / Reason for Exclusion from Analysis	Source Make	Source Model	Source Size	Size Units
534234				Control	REGENERATIVE/RECUPERATIVE OXIDIZER-CERAMIC/HOT ROCK	3/21/2012	APPLICATION CHANGED FROM CLASS I - III	Yes	Permit to Construct	Yes	Yes	New source of emissions, but increase moderated by a change in conditions to another similar source that decreased emissions.	ADWEST	RETOX 50.0 RTO97	7,500	SCF/HR

CH2MHILL® TELEPHONE CONVERSATION RECORD

Call To: Rene Loof, Engineer, South Coast Air Quality Management District

Phone No.: (909) 396-2544 **Date:** 12/5/12

Call From: Beth Storelli **Time:** 3:40pm

Message Taken By: Beth Storelli

Subject: Source Information

Project No.: 458993.01.01

Notes:

I requested the following information from Mr. Loof:

- Need 3 applications for the RTO (thermal oxidizers): 534234, 532302, 519602
- Control # 70237 ARLON GRAPHICS L.L.C. - Facility 167066
    - Appl # 534234
    - Need stack parameters for RTO (application # 534234)

Mr. Loof provided me with the following information:

Application #534234:
Flow: 57,500 scf
Ht: 25 ft
Dia: 52 inches
Temp: 195 F

Application #532302: This application was a change of conditions to make it more of a standby RTO. He had to go back to an application from Nov 29, 1995 (App #: 348436) to provide me with the following information:

Flow: 57,500 scf
Ht: 25 ft
Dia: 52 inches
Temp: 195 F

Application #519602: Mr. Loof did not have this application. According to FIND, this application was for Change of Ownership, so would not be applicable for us. Mr. Loof mentioned that 532302 could have replaced 519602.

If we want the whole application/permits, we would need to go back through the Public Request process.

Contaminant	C28 RTO 30 day average	C4 coating 30 day average	C4 afterburner 30 day average	Delta
ROG*	0	0.216	0	0
NOx	19.87	1.20	23.8	-2.73
Sox	0.17	0.03	0.15	+0.05
CO	12.21	2.288	6.4	+8.09
PM10	1.54	0.231	1.371	+0.4

*the facility operates under a VOC cap and the operation of the new line will be kept under the facility VOC limit.

Risk Assessment:

Application 534232 Device C28 (new RTO)

This equipment passes Tier 2 Screen Risk Assessment for the combustion emissions from the new RTO with the following results:

Tier 2 results:

MICR	Residential	Commercial
	ASI	ASI
	1.25E-08	1.04 E-08
	Passes	Passes

The Hazard Index had no cumulative impact that exceeded 1.0 for the target organs for Acute or Chronic.

Application 532302 Device C4 (existing Afterburner)

This equipment is having its exhaust modified to accommodate the new C4 coating line. It is limited to 25,000 cfm and will not see an increased capacity. C4 will be conditioned so that it can only vent two lines at anytime. The modification will not cause an increase in toxic emissions and is exempt from the requirements of Rule 1401 pursuant to 1401(g)(1)(B) "Modifications with no increase in risk."

Application 532300 Device D26 & D27 (existing Prime Coating Line)

This application has been submitted as a change of condition to change the reporting method for triethylamine(TEA) usage. Originally the facility reported total gallons of material that included a diluted concentrated which contained TEA. They are requesting to report only TEA usage. Condition C1.3 will change from 16,560 gallons per month of materials containing TEA to 580 pounds per month of TEA. The content restriction of TEA in B59.3 will be removed. There will be no increase in TEA therefore this change of condition is exempt from the requirements of Rule 1401 pursuant to 1401(g)(1)(B).

Application 534234 Device D30 & D31 (New Vinyl Coating Line C4)

The new coating line will use the following hazardous materials:

Contaminant	Annual Controlled	Hourly
Ethylbenzene	3.0 lbs/yr	3.434E-04
Xylene	6,337	0.725

Facility Name:	Huntington Beach City, Water Dept.
Address:	19001-71 Huntington Street, Huntington Beach, CA 92648
FIND Date:	1/15/2016
Control #:	84575
Miles from HBEP:	< 3 miles

Application Number	Permit Number	Permit Issued Date	Permit Status	Equipment Type	Equipment Description	Application Date	Application Status	Step 2 - Source Applicability (FIND Data)		Step 3 - Source Applicability (PRR Data)			Source Information			
								Source Included? (Yes or No)	Application Type	PRR Data Received	Source Included? (Yes or No)	Reference of Data for Analysis / Reason for Exclusion from Analysis	Source Make	Source Model	Source Size	Size Units
561605	G35553	5/5/2015	ACTIVE	Basic	I C E (50-500 HP) N-EM STAT NAT GAS ONLY	3/11/2014	PERMIT TO OPERATE GRANTED	Yes	Alteration / Modification	Yes	Yes	New 585 hp engine was installed in 2012 and operated without a permit.	Waukesha	H24GSID	585	BHP

PERMIT TO OPERATE

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301.f) is not received by the expiration date, contact the District.

Legal Owner or Operator:

ID 20231

HUNTINGTON BEACH CITY, WATER DEPT
19001 HUNTINGTON ST, ATTN: JAY KLEINHEINZ
HUNTINGTON BEACH, CA 92648

Equipment Location: 19001-71 HUNTINGTON ST, HUNTINGTON BEACH, CA 92648-2211

Equipment Description :

Internal Combustion Engine, Waukesha, Model No. H24GSID, Serial No. 5283701135, Natural Gas Fueled, Four Cycles, Eight Cylinders, Turbocharged and Intercooled, Rich Burn, Rated at 585 B.H.P., with a Non-Selective Catalytic Reduction Converter, Miratech, Model No. IQS-20-08-EC1, and an Air-to-Fuel Ratio Controller, Compliance Controls, Model No. MECR-64, Driving an Emergency Electrical Generator.

Conditions :

1. Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. This equipment shall be properly maintained and kept in good operating condition at all times.

3. This engine shall be fired with natural gas only.

4. The engine emissions shall not exceed the following limits (except during cold start-up which shall not exceed 30 minutes):

Volatile Organic Compounds (VOC)	1.5 grams/bhp-hr
Oxides of Nitrogen (NOx)	1.5 grams/bhp-hr
Carbon Monoxide (CO)	2.0 grams/bhp-hr

5. This engine shall not be operated unless its exhaust is vented to the Non-Selective Catalytic Reduction unit which is in full operation and which is in good operating condition at all times.

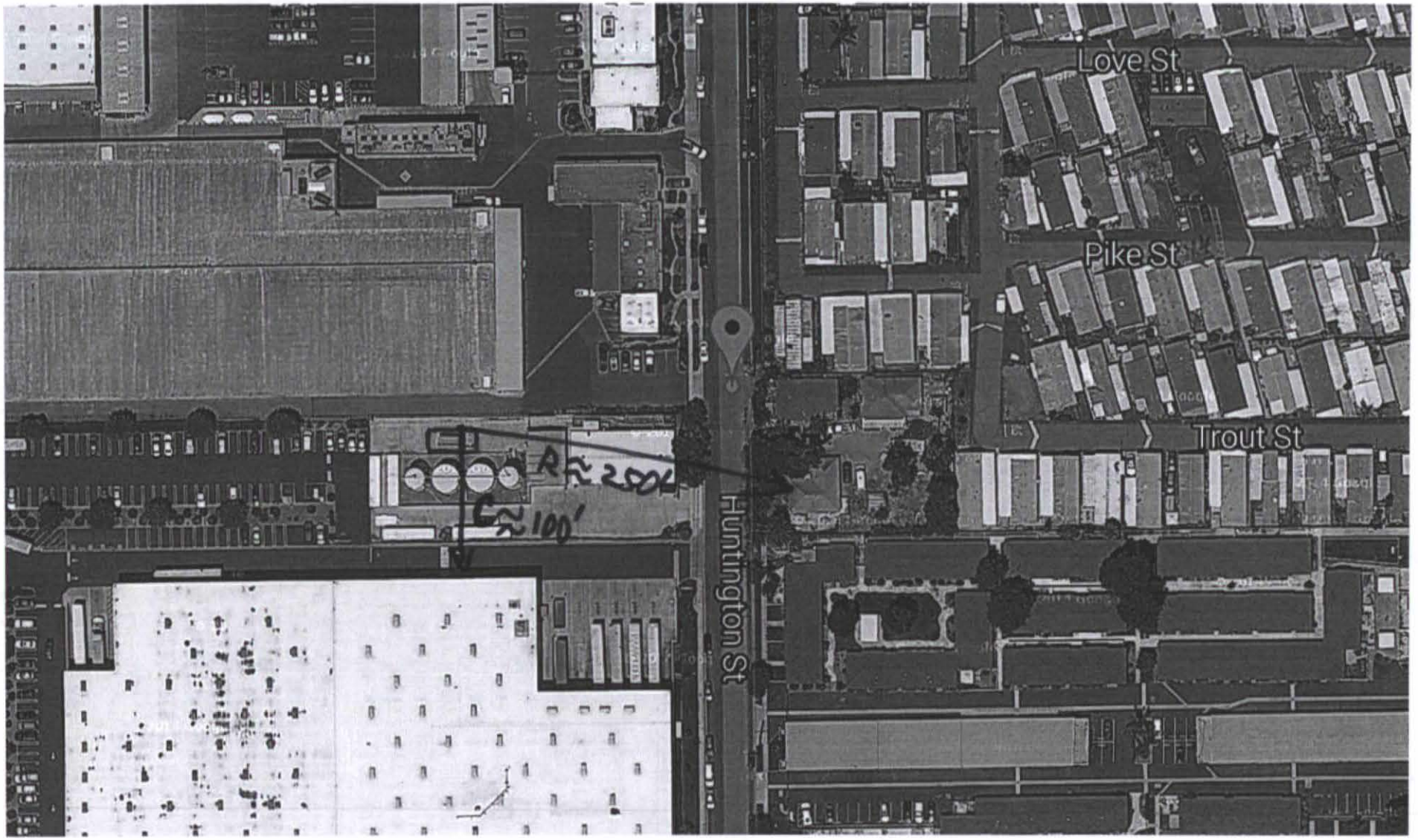
6. This engine shall not be operated without the use of an automatic Air-to-Fuel Ratio Controller which shall be maintained and kept in proper operating condition at all times.

7. This engine shall not be operated more than 200 hours in any one year, which includes no more than 50 hours in any one year and 5 hours in any one month for maintenance and testing purposes.

8. An operational non-resettable totalizing time meter shall be installed and maintained to indicate the engine elapsed operating time.

19071 Huntington St

19071 Huntington St, Huntington Beach, CA 92648



TIER 1 / TIER 2 SCREENING RISK ASSESSMENT DATA INPUT

Application deemed complete date:	10/19/12
A/N:	543492
Fac:	HUNTINGTON BCH UTILITIES

Stack Data

		Units
Hour/Day	4	hr/day
Day/Week	1	day/wk
Week/Year	50	wk/yr
Emission Units	lb/hr	
		0
Control Efficiency	0.00	fraction range 0-1
Does source have TBACT?	YES	
Point or Volume Source ?	P	P or V
Stack Height or Building Height	15	feet
Area (For Volume Source Only)		ft^2
Distance-Residential	76	meters
Distance-Commercial	31	meters
Meteorological Station	Costa Mesa	

Source Type:	R - Rich Burn ICE
Screening Mode (NO = Tier 1 or Tier 2; YES = Tier 3)	NO

Emission Units	lb/hr	
Source output capacity	585	hp

FOR USER-DEFINED CHEMICALS AND EMISSIONS, FILL IN THE TABLE BELOW

USER DEFINED CHEMICALS AND EMISSIONS				R1 - Uncontrolled	Efficiency Factor	R2 - Controlled
Cmpound Code	Compound	lb/hr	Molecular Weight	lbs/hr	Fraction range 0-1	lbs/hr
				0	0.00000	
				0	0.00000	
				0	0.00000	
				0	0.00000	
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DRESSER
Waukesha

Certificate of Engineering Approval

Are Special Codes or Equipment Required for this Approval? Yes

List:

Code 2100: Dual Fuel System GSID - Natural gas and propane vapor. OR customer to supply dual fuel system

Approval Criteria

Ignition Timing:	See Approval Criteria
Carb Setting (Lambda or MAFR):	0.35% CO

When operating per the site conditions listed and when using a commercial quality natural gas consisting of 93% Methane by volume, WKIŽ = 91, and 900 Btu/ft3 SLHV, Dresser Waukesha approves a maximum standby rating of 585 bhp @1800 RPM for the duration of the power outage.

With the engine operating at 585 bhp @1800 rpm, the following fuel consumption, heat rejection, and emissions are guaranteed:

100% Load, CQNG, 23 BTDC - Guaranteed Data

Load (bhp):	585
Speed:	1800 RPM
Overload:	0 %
BSFC (Btu/Bhp-hr):	7366 -0/+5 % → 4104 ft3/hr
Induction Air (SCFM):	845 ± 7 %
Exhaust Flow (lb/hr):	3761 ± 7 %
Exhaust Temp (°F):	1116 ± 75°

Heat to (Btu/hr x 1000)

Jacket Water :	1297 ± 8 %
Lube Oil:	231 ± 8 %
Intercooler:	119 ± 8 %
Total Exhaust:	1143 ± 8 %
Radiation:	113 ± 30 %

Emissions guaranteed not to exceed:

NOx:	16 g/bhp-hr
CO:	8 g/bhp-hr
NMHC:	0.25 g/bhp-hr

SCAQMD PERMIT PROCESSING SYSTEM (PPS)

AEIS DATA SHEET

Company Name : HUNTINGTON BEACH CITY, WATER DEPT
Facility ID : 20231
Equipment Address : 19001-71 HUNTINGTON ST
HUNTINGTON BEACH CA 92648

Application Number : 561605
Equipment B-Cat : 040001
Estimated Completion Date : 05/05/15
Equipment C-Cat :
Equipment Type : Basic
Equipment Description : I C E (50-500 HP) N-EM STAT NAT GAS ONLY

	Emissions	
Emittants	R1 LB/HR	R2 LB/HR
CO	2.58	2.58
NOX	1.93	1.93
PM10	0.06	0.06
ROG	1.93	1.93

Applicable Rules

401	11/09/2001	Visible Emissions
402	05/07/1976	Nuisance
404	02/07/1986	Particulate Matter - Concentration
431.1	06/12/1998	Sulfur Content of Gaseous Fuels
60SubpartJJJJ	01/18/2008	Stationary Spark Ignition Internal Combustion Engines

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Daily Start Times :	08:00	00:00	00:00	00:00	00:00	00:00	00:00
Daily Stop Times :	09:00	00:00	00:00	00:00	00:00	00:00	00:00

User's Initials : RR08 Date: 05/05/15 Supervisor's Name : _____ Review Date : / /

NSR DATA SUMMARY SHEET

Application No	561605
Application Type	50
Application status	PENDAPPRV
Previous Apps, Dev	281006,0

Company Name	HUNTINGTON BEACH CITY, WATER DEPT
Company ID	20231
Address	19001-71 HUNTINGTON ST, HUNTINGTON BEACH, CA 92648-2211
Reclaim	NO
Reclaim Zone	01
Air Basin	SC
Zone	18
Title V	NO

Device ID	0 - ICE-PPS
Estimated Completion Date	06-01-2012
Heat Input Capacity	0 Millions BTU/Hr
Priority Reserve	NONE - No Priority Access Requested
Recommended Disposition	31 - PERMIT TO OPERATE GRANTED
PR Expiration	12-31-9999
School within 1,000 feet	NO
Operating Weeks per year	50
Operating Days per week	1
Operating Hours	
Monday	08:00 to 09:00
Tuesday	00:00 to 00:00
Wednesday	00:00 to 00:00
Thursday	00:00 to 00:00
Friday	00:00 to 00:00
Saturday	00:00 to 00:00
Sunday	00:00 to 00:00

Emittant	CO	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	-3.57	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	2.58	Lbs/Hr
Max Daily	2.58	Lbs/day
Uncontrolled Emission		
Max Hourly	2.58	Lbs/Hr
Max Daily	2.58	Lbs/day
Current Emission		
BACT 30 Day Avg	0.43	Lbs/day
Annual Emission	131.55	Lbs/year
District Emission	1301(b)(1) - 12-07-1995	

Emittant	NOX	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	-1.68	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	1.93	Lbs/Hr
Max Daily	1.93	Lbs/day
Uncontrolled Emission		
Max Hourly	1.93	Lbs/Hr
Max Daily	1.93	Lbs/day
Current Emission		
BACT 30 Day Avg	0.32	Lbs/day
Annual Emission	98.66	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Emittant	PM10	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.06	Lbs/Hr
Max Daily	0.06	Lbs/day
Uncontrolled Emission		
Max Hourly	0.06	Lbs/Hr
Max Daily	0.06	Lbs/day
Current Emission		
BACT 30 Day Avg	0.00	Lbs/day
Annual Emission	2.84	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Application No	561605	Company ID	20231

Emittant	ROG	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	-1.68	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	1.93	Lbs/Hr
Max Daily	1.93	Lbs/day
Uncontrolled Emission		
Max Hourly	1.93	Lbs/Hr
Max Daily	1.93	Lbs/day
Current Emission		
BACT 30 Day Avg	0.32	Lbs/day
Annual Emission	98.66	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Emittant	SOX	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.00	Lbs/Hr
Max Daily	0.00	Lbs/day
Uncontrolled Emission		
Max Hourly	0.00	Lbs/Hr
Max Daily	0.00	Lbs/day
Current Emission		
BACT 30 Day Avg	0.00	Lbs/day
Annual Emission	0.00	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Supervisor's Approval _____ Supervisor's Review Date _____

Processed By rronquil

Facility Name:	Fabrica
Address:	3201 S. Susan Street, Santa Ana, CA 92704
FIND Date:	1/15/2016
Control #:	84580
Miles from HBEP:	< 6 miles

Application Number	Permit Number	Permit Issued Date	Permit Status	Equipment Type	Equipment Description	Application Date	Application Status	Step 2 - Source Applicability (FIND Data)		Step 3 - Source Applicability (PRR Data)			Source Information			
								Source Included? (Yes or No)	Application Type	PRR Data Received	Source Included? (Yes or No)	Reference of Data for Analysis / Reason for Exclusion from Analysis	Source Make	Source Model	Source Size	Size Units
572751				Basic	PLASMA ARC CUTTING	2/25/2015	ASSIGNED TO ENGINEER - CLASS III	Yes	Permit to Operate	Yes	Yes	Plasma cutting emissions based on AP-42 reference material, control efficiency of 99.97% based on spec sheet for attached control equipment per PTO.	N/A	Plasma cutter with Avani Env. SPC-230 filter	N/A	N/A
566167				Basic	I C E (50-500 HP) N-EM STAT NAT GAS ONLY	7/1/2014	APPLICATION CHANGED FROM CLASS I - III	Yes	Permit to Construct	Yes	Yes	200 kW natural gas ICE used as part of a cogeneration system with an existing boiler, and does not operate as an emergency or standby unit. This is a new source and should be included.	Benz Air Engineering Co.	454-Epower	200	KW

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

Title Page
Facility ID: 095212
Revision #: 37
Date: January 01, 2016

FACILITY PERMIT TO OPERATE

FABRICA
3201 S SUSAN ST
SANTA ANA, CA 92704

NOTICE

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR A COPY THEREOF MUST BE KEPT AT THE LOCATION FOR WHICH IT IS ISSUED.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT SHALL NOT BE CONSTRUED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF ANY OTHER FEDERAL, STATE OR LOCAL GOVERNMENTAL AGENCIES.

Barry R. Wallerstein, D. Env.
EXECUTIVE OFFICER

By
Mohsen Nazemi, P.E.
Deputy Executive Officer
Engineering & Compliance

FACILITY PERMIT TO OPERATE
FABRICA

SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions* And Requirements	Conditions
Process 2: BOILERS					
NON-SELECTIVE CATALYTIC REDUCTION, THREE-WAY CATALYTIC CONVERTER SILENCER, MAGNEFLOW, MODEL NO. 447109, EXHAUST CONNECTED TO THE FGR OF KEELER BOILER (D9) A/N: 566167 Permit to Construct Issued: 01/15/15	C25	D23			
Process 6: Maintenance and Fabrication					
DUST COLLECTOR, AVANI ENVIRONMENTAL, MODEL SPC-230, 0.75 HP BLOWER, 39 SQ.FT.; 5 CARTRIDGE A/N:	C26	D27			E102.1
PLASMA ARC CUTTER A/N: 574840 Permit to Construct Issued: 07/30/15	D27	C26			

* (1) (1A) (1B) Denotes RECLAIM emission factor
(2) (2A) (2B) Denotes RECLAIM emission rate
(3) Denotes RECLAIM concentration limit
(4) Denotes BACT emission limit
(5) (5A) (5B) Denotes command and control emission limit
(6) Denotes air toxic control rule limit
(7) Denotes NSR applicability limit
(8) (8A) (8B) Denotes 40 CFR limit (e.g. NSPS, NESHAPS, etc.)
(9) See App B for Emission Limits
(10) See section J for NESHAP/MACT requirements

** Refer to section F and G of this permit to determine the monitoring, recordkeeping and reporting requirements for this device.

SPC-230

The SPC-230 is Avani's handheld portable fume extraction unit. This device can be transported with ease around your workplace and designed for "point of origin" extraction for any work area. Suitable for welding fumes, grinding dust and soldering dust, it's light weight construction and 5 stage filtration system makes the SPC-230 a very versatile portable fume collector.

5 STAGE FILTRATION:

1 Stainless Filter captures up to 95% of sparks and steel chips

2 Pre-filter captures 35% of small particles and absorbs oils to extend life of pleated HEPA filter

3 Second pre-filter captures 85% of small particles and absorbs oil to extend life of pleated HEPA filter

4 Pleated filter for fine dusts

5 Pleated HEPA filter captures 99.97% of .3 micron noxious fumes

Avani Environmental SPC-230

PORTABLE FUME COLLECTOR COMPARISONS

click for portable collector comparison

SPECIFICATIONS

- **Fume Arm:** 2.5" dia. x 10' hose
- **Hood:** 4" diameter
- **Dimensions:** 28.6" x 18 x 19"
- **Packing dimensions:** 23.8" x 21.5" x 35.4"
- **Air Flow:** 230 CFM
- **Weight:** 62 lbs

FEATURES

- 5 Layers of High Efficiency Filtration
- Powder coated (custom colors available)
- Lightweight and Portable
- All Accessories Are Included
- Pleated HEPA filter Can Be Reused
- Variable speed control

A•10 Oil Smoke & Oil Mist Filtration...

Silencer

Safety cage

OPTIONS

SPC-230X

Cart and arm addition featuring 3" fume arm

SUBMITTAL

Submittal for SPC-230

Search...

IMTS 2016

FABTECH 2016

Nov 16 -18 | Las Vegas Convention Center | Booth N1332

LITERATURE

- Cut Sheets
- Line Card
- Trade Up Request Form

Absolent group | An Absolent Group Company

SITE INFO

- Product Registration
- Glossary of Terms
- Q & A Life Time Warranty
- Privacy Policy
- Site Map

IIW/IIS VIII-F105-95

Emission of Fume, Nitrogen Oxides and Noise in Plasma Cutting of Stainless and Mild Steel

by Bromsen B. et al

The Swedish Institute of Production Engineering Research

Goteborg

Sweden

Abstract: The amount of fumes and gases in plasma cutting operations depends on dry or wet cutting, cutting speed, plate thickness, alloy contents, design of cutting table, choice of gas and ventilation conditions. A "comparable" method has been used to measure in an exhaust channel the total emission of airborne fumes and nitrogen oxides in different cutting tests. Noise levels were also determined.

Already published as: IIW Document 1E-174-93 Edition March 1994

Doc. IE-174-93 Edition march 1994

Emission of fume, nitrogen oxides and noise in plasma cutting of stainless and mild steel

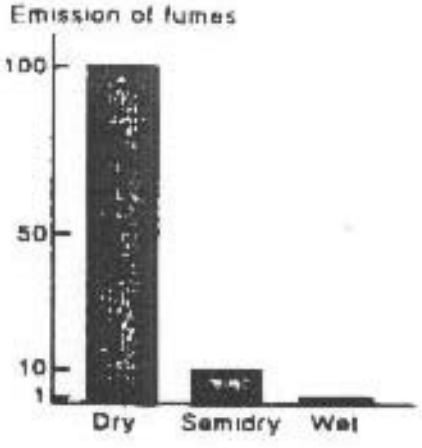
Bernt von Brömssen, The Swedish Institute of Production Engineering Research
Linnéa Lillienberg, Department of Occupational Medicine, Sahlgren Hospital
Niklas Fröjd, The Swedish Institute of Production Engineering Research

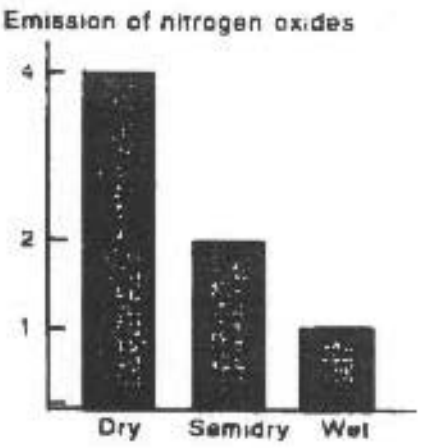
The amount of fumes and gases in plasma cutting operations depends on dry or wet cutting, cutting speed, plate thickness, alloy contents, design of cutting table, choice of gas and ventilation conditions. A "comparable" method has been used to measure in an exhaust channel the total emission of airborne fumes and nitrogen oxides in different cutting tests.

Cutting tests were performed in 8 mm thick mild steel with air and oxygen as plasma gases and in 8 and 35 mm thick stainless steel with air and nitrogen as plasma gases. All cutting tests used a current of 200 Ampere and air as shielding gas. The cutting speed varied between 2,7 m/min and 4,5 m/min for 8 mm plate thickness and from 0,3 to 0,45 m/min for 35 mm thickness. All cutting tests were repeated 2 or 3 times with measurements of fumes and nitrogen oxides.

Three different cutting techniques were used:

- Dry cutting
- Semidry cutting (water about 50 mm under the plate)
- Wet cutting (the burner 70 mm below the water surface)





The investigation showed that the three different cutting techniques gave a constant ratio between the amount of emitted fumes of 100:10:1 (dry = 100, semidry = 10, wet = 1). Similarly there was a constant ratio between the amount of emitted nitrogen oxides of 4:2:1 for dry, semidry and wet cutting. These relationships are valid both for mild and stainless steel.

Emission of fumes in plasma cutting of mild and stainless steel			
Material, thickness	**Dry (g/min)**	**Semidry (g/min)**	**Wet (g/min)**
Mild steel, 8 mm	20 - 26	2,0 - 4,0	0,1 - 0,4
Stainless steel, 8 mm	30 - 40	3,6 - 4,6	0,2 - 0,5
Stainless steel, 35 mm	1,8 - 3,4	0,1 - 0,3	0,02

The emission of fumes in 8 mm thick mild steel and 8 mm stainless steel were about the same. In 35 mm stainless steel the emission of fumes were about 10 times lower, at the same time as the cutting speed was about 10 times lower. The components in fumes from mild steel were metal oxides with 67 - 73 % iron, 2 - 10 % manganese and copper from not detectable to 1,4 %. Chromium, nickel and molybdenum were in most samples not detectable. The metal contents in stainless steel cutting varied for iron between 38 - 44 %, chromium 12 - 20 %, nickel 4 - 8 %, (uncertain figures manganese 4 - 10 %, copper 2 - 6 % and up to 1 % molybdenum). The composition was about the same independent of plasma gas, plate thickness and cutting speed.

Dry cutting in mild steel with oxygen as plasma gas gave an emission of fumes 25 % lower compared to air as plasma gas.

Emission of fumes expressed as % of the total amount of material removed by cutting			
Material, thickness, cutting speed	**Dry (%)**	**Semidry (%)**	**Wet (%)**
Mild steel, 8 mm, 3,5 m/min	5,0	0,5	0,05
Stainless steel, 8 mm, 3,5 m/min	7,0	0,7	0,07
Stainless steel, 35 mm, 0,375 m/min	1,0	0,1	0,01

The cutting kerf width in 8 mm plate thickness was 2 - 3 mm and 3 - 4 mm in plate thickness of 35 mm. The amount of emitted fumes expressed as % of the total amount of material removed by cutting can bee seen in the table above. For dry cutting in 8 mm plate thickness about 95 % of the material removed by cutting will remain in the cutting table. The corresponding amount for wet cutting in 35 mm thick stainless steel will be 99,99 %.

Exposure measurements of fume, gases and noise

Exposure measurements of fumes, gases and noise in plasma cutting in stainless steel were performed at a company with two plasma cutting tables in the size of 18 * 4 m. The cutting was carried out semidry with the water level 25 mm below the plate´s lower surface. Measurements were performed in three cutting periods during a total time of 3,5 hours.

Respirable and total concentration of fumes were below the exposure limit values for fume in the exposure measurements. During 1,5 hours of intensive cutting at one of the cutting machines the concenurations of chromium and nickel on the operator exceeded the exposure limit values. At the same time cutting at the other machine gave the operator a 50 % lower exposure level of chromium and nickel although cutting conditions were equivalent. The differences probably depend on the operators position related to the plasma torch and on draught in the local environment, which affects the direction of the plume of fume, rather than minor differences in material and plasma gases.

Exposure measurements of nitrogen dioxides showed relative low exposure levels. The highest level 0,4 ppm was measured on the operator who also was exposed to the highest levels of chromium and nickel. With a direct reading instrument 2 ppm nitrogen dioxide was measured for short periods in the operators breathing zone. Ozon and carbon monoxide were in all tests close to zero.

The sound pressure level at the place of the operator was for semidry cutting in 90 mm thick stainless steel 108 dB(A) with a broadband spectrum without any elements of pure tones. The upper band of frequencies dominated the dB(A) value.

The sound pressure level at the place of the operator for semidry cutting in 10 mm thick stainless steel was 103 dB(A). Personal exposure measurements for a period of 2½ hour showed a mean value of 98 dB(A) for the operator. The background noise varied between 68 and 85 dB(A).

Although the measurements were not performed during a whole working shift and therefore not can be compared to the exposure limit values, the results indicate that some actions should be taken in order to decrease the exposure levels.

After this measurement the company has installed an exhausting device close to the torch and slots exhausting devices under the portal girder on the machine where the highest exposure levels were measured. On the other plasma machine the walls at the cutting table have been raised in order to perform wet cutting.

Emission of nitrogen oxides			
Material, thickness	**Dry (l/min)**	**Semidry (l/min)**	**Wet (l/min)**
Mild steel, 8 mm	4,4 - 5,5	2,4 - 3,1	0,5 - 1,6
Stainless steel, 8 mm	4,1 - 5,4	2,2 - 2,7	0,9 - 1,4
Stainless steel, 35 mm	7,0 - 7,8	3,2 - 4,6	1,7 - 2,2

The amount of emitted nitrogen oxides increased with increasing thickness of plate. Cutting in 35 mm stainless steel increased the emission almost twice compared to cutting in steel of 8 mm thickness. The emission of nitrogen dioxide (NO_2) was about 7 - 8 % of the total emission of nitrogen oxides (NO and NO_2). Dry plasma cutting in stainless steel with nitrogen as plasma gas gave 20 % lower emission of nitrogen oxides compared to when air was used.

A few samples of the fume have been analysed for size distribution in a scanning electron microscope. Even if each particle was small, $<< 1\ \mu m$, most of the particles aggregated to bigger units. In semidry cutting those aggregates seemed to create regularly spheres with a diameter of about 11 μm. In dry cutting the aggregates were bigger, while wet cutting gave aggregates of more irregular form and a diameter less than 10 μm.

Emission of noise		
Cutting technique	**Water level above the plate (mm)**	**Sound pressure (dBA)**
Dry	- 250	98
Semidry	- 48	103
Semidry	- 25	103
Semidry	0	100
Wet	+ 25	92
Wet	+ 50	78
Wet	+ 75	71

Wet cutting considerably decreased the emission of noise compared to dry cutting. A reduction of the sound pressure (noise level) with 30 - 40 dB(A) was possible for the region of high frequencies, where the sound pressure seemed to be very irritating. The water level should be at least 75 mm above the plate in order to give this reduction.

PLASMA CUTTING (Compressed Air) FOR STAINLESS PLATE

Type Plate (Stainless)	Current	Travel Speed (i.p.m.)	Plate: Start Wt.	Plate: Final Wt.	Plate: Dross Wt.	Plate: Actual Wt. Loss (grams)	Fume: Filter Start Wt.	Fume: Filter Final Wt.	Fume: Filter Wt Gain (grams)	Fume: Test Time (min.)	Fume: F.G.R g/min
304L (1/2" X 6" X 10")	63A										
310 (1/2" X 6" X 10")	63A	6.3	4465.5	4412.0	28.7	24.4	13.16	13.32	.16	.65	.25

310 Stainless

PLATE CHEMISTRY

%C	%Mn	%Si	%S	%P	%Cr	%Ni
.029	1.14	.62	<.003	.021	25.4	19.6

FUME CHEMISTRY

%Fe	%Mn	%Ni	%Cr(sol) VI	%Cr(insol) VI	%Cr(non) VI	%Cr(total) VI
25.4	4.4	10.3	.42	.77	19.0	20.2

304L Stainless

PLATE CHEMISTRY

%C	%Mn	%Si	%S	%P	%Cr	%Ni
.019	1.77	.45	.018	.030	18.2	8.2

FUME CHEMISTRY

%Fe	%Mn	%Ni	%Cr(sol) VI	%Cr(insol) VI	%Cr(non) VI	%Cr(total) VI

L

6/4/03

Representative Plasma Cutter Emissions

Huntington Beach Cumulative Assessment
August 2016

	Fume (PM) Emissions [a]		
	g/min	g/sec	lb/day
Before Control	40	0.67	127.0
After Control	0.012	0.0002	0.04

[a] Emission data taken from AP-42 cited Main Document (https://www3.epa.gov/ttn/chief/efdocs/welding.pdf). Emission estimate is conservatively based upon maximum emission scenario presented (8 mm stainless steel).

Control Efficiency [b]	99.97%

[b] Control efficiency taken from manufacturer data for the control equipment model supplied in Facility Permit to Operate.

	NO_X Emissions		
	L/min	lb/hr [d]	tpy
NO_X Emissions [c]	5.4	1.37	5.98

[c] NO_X emission data taken from AP-42 cited Main Document (https://www3.epa.gov/ttn/chief/efdocs/welding.pdf). Emission estimate is conservatively based upon maximum emission scenario presented, assuming the same plate thickness used for the fume emissions above (8 mm stainless steel).

[d] Emission rates converted from L/min to lb/hr using the Ideal Gas Law and NTP conditions.

FACILITY PERMIT TO OPERATE
FABRICA

SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

The operator shall comply with the terms and conditions set forth below:

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions* And Requirements	Conditions
Process 2: BOILERS					
BOILER, KEELER, WATER-TUBE TYPE, WITH A COEN RING BURNER, FLUE GAS RECIRCULATION (FGR), NATURAL GAS, WITH THE NSCR (C25) EXHAUST CONNECTED TO THE FLUE GAS RECIRCULATION (FGR) BLOWER, 26 MMBTU/HR A/N: 570136 Permit to Construct Issued: 01/15/15	D9	D23	NOX: LARGE SOURCE**	**CO**: 400 PPMV NATURAL GAS (5) ; **NOX**: 15 PPMV NATURAL GAS (3) ; **NOX**: 30 PPMV NATURAL GAS (4)	C1.4, D28.2, K40.1
INTERNAL COMBUSTION ENGINE, NATURAL GAS, GM/BENZ AIR ENGINEERING CO., EIGHT CYLINDERS, MODEL 454-EPOWER, 200 KW A/N: 566167 Permit to Construct Issued: 01/15/15	D23	D9 C24 C25	NOX: PROCESS UNIT**	**CO**: 0.2 LBS/GROSS MWH NATURAL GAS (4) ; **CO**: 0.2 LBS/GROSS MWH NATURAL GAS (5) ; **NOX**: 0.07 LBS/GROSS MWH NATURAL GAS (4) ; **ROG**: 0.1 LBS/GROSS MWH NATURAL GAS (4) ; **ROG**: 0.1 LBS/GROSS MWH NATURAL GAS (5)	C1.4, E71.2
NON-SELECTIVE CATALYTIC REDUCTION, THRE-WAY CATALYTIC CONVERTER SILENCER, MAGNEFLOW, MODEL NO. 447109, EXHAUST CONNECTED TO THE FGR OF KEELER BOILER (D9) A/N: 566167 Permit to Construct Issued: 01/15/15	C24	D23			

* (1) (1A) (1B) Denotes RECLAIM emission factor (2) (2A) (2B) Denotes RECLAIM emission rate
(3) Denotes RECLAIM concentration limit (4) Denotes BACT emission limit
(5) (5A) (5B) Denotes command and control emission limit (6) Denotes air toxic control rule limit
(7) Denotes NSR applicability limit (8) (8A) (8B) Denotes 40 CFR limit (e.g. NSPS, NESHAPS, etc.)
(9) See App B for Emission Limits (10) See section J for NESHAP/MACT requirements

** Refer to section F and G of this permit to determine the monitoring, recordkeeping and reporting requirements for this device.

GENERAC® | INDUSTRIAL POWER

SG200 200 kW

SG200

14.2L

Industrial Spark-Ignited Generator Set

EPA Certified Stationary Emergency

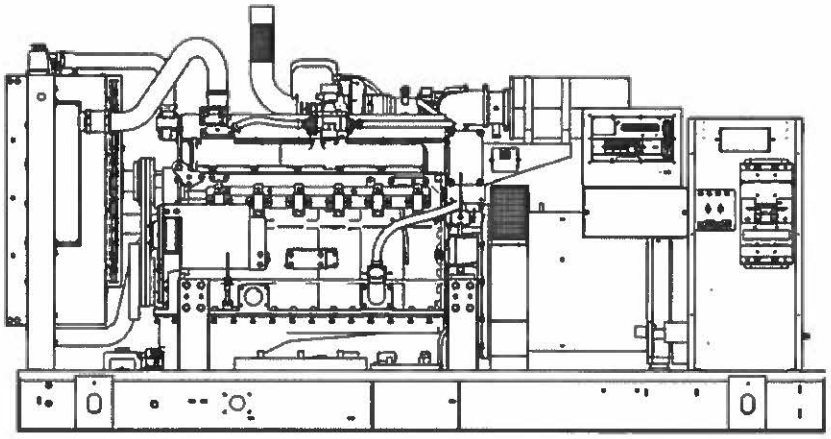
Standby Power Rating
200 kW 250 kVA 60 Hz

Prime Power Rating*
180 kW 225 kVA 60 Hz

ISO 9001:2008

USA ENGINEERED & BUILT*

*Built in the USA using domestic and foreign parts



*EPA Certified Prime ratings are not available in the U.S. or its Territories

Image used for illustration purposes only

Codes and Standards

Generac products are designed to the following standards:

UL2200, UL508, UL142, UL498

NFPA70, 99, 110, 37

NEC700, 701, 702, 708

ISO9001, 8528, 3046, 7637, Pluses #2b, 4

NEMA ICS10, MG1, 250, ICS6, AB1

ANSI C62.41

American National Standards Institute

IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

For over 50 years, Generac has led the industry with innovative design and superior manufacturing.

Generac ensures superior quality by designing and manufacturing most of its generator components, including alternators, enclosures and base tanks, control systems and communications software.

Generac's gensets utilize a wide variety of options, configurations and arrangements, allowing us to meet the standby power needs of practically every application.

Generac searched globally to ensure the most reliable engines power our generators. We choose only engines that have already been proven in heavy-duty industrial application under adverse conditions.

Generac is committed to ensuring our customers' service support continues after their generator purchase.

SG200

Configurable Options

ENGINE SYSTEM

General

- O Engine Block Heater
- O Oil Heater
- O Air Filter Restriction Indicator
- O Stone Guard (Open Set Only)

Engine Electrical System

- O 10A UL battery charger
- O 2.5A UL battery charger
- O Battery Warmer

ALTERNATOR SYSTEM

- O Alternator Upsizing
- O Anti-Condensation Heater
- O Tropical coating

GENERATOR SET

- O Gen-Link Communications Software (English Only)
- O Extended Factory Testing (3 Phase Only)
- O 8 Position Load Center
- O 2 Year Extended Warranty
- O 5 Year Warranty
- O 5 Year Extended Warranty

CIRCUIT BREAKER OPTIONS

- O Main Line Circuit Breaker
- O 2nd Main Line Circuit Breaker
- O Shunt Trip and Auxiliary Contact
- O Electronic Trip Breakers

ENCLOSURE

- O Standard Enclosure
- O Level 1 Sound Attenuation
- O Level 2 Sound Attenuation
- O Steel Enclosure
- O Aluminum Enclosure
- O 150 MPH Wind Kit
- O 12 VDC Enclosure Lighting Kit
- O 120 VAC Enclosure Lighting Kit
- O AC/DC Enclosure Lighting Kit
- O Door Alarm Switch

CONTROL SYSTEM

- O 21-Light Remote Annunciator
- O Remote Relay Panel (8 or 16)
- O Oil Temperature Sender with Indication Alarm
- O Remote E-Stop (Break Glass-Type, Surface Mount)
- O Remote E-Stop (Red Mushroom-Type, Surface Mount)
- O Remote E-Stop (Red Mushroom-Type, Flush Mount)
- O Remote Communication - Modem
- O Remote Communication - Ethernet
- O 10A Run Relay
- O Ground fault indication and protection functions

Engineered Options

ENGINE SYSTEM

- O Coolant heater ball valves
- O Fluid containment pans

ALTERNATOR SYSTEM

- O 3rd Breaker Systems

GENERATOR SET

- O Special Testing
- O Battery Box

ENCLOSURE

- O Motorized Dampers
- O Enclosure Ambient Heaters

CONTROL SYSTEM

- O Spare inputs (x4) / outputs (x4) - H Panel Only
- O Battery Disconnect Switch

Rating Definitions

Standby – Applicable for a varying emergency load for the duration of a utility power outage with no overload capability.
Prime – Applicable for supplying power to a varying load in lieu of utility for an unlimited amount of running time. A 10% overload capacity is available for 1 out of every 12 hours. The Prime Power option is only available on International applications.

Power ratings in accordance with ISO 8528-1, Second Edition dated 2005-06-01, definitions for Prime Power (PRP) and Emergency Standby Power (ESP).

SG200 operating data

POWER RATINGS

	Natural Gas	
Single-Phase 120/240 VAC @1.0pf	200 kW	Amps: 833
Three-Phase 120/208 VAC @0.8pf	200 kW	Amps: 694
Three-Phase 120/240 VAC @0.8pf	200 kW	Amps: 601
Three-Phase 277/480 VAC @0.8pf	200 kW	Amps: 301
Three-Phase 346/600 VAC @0.8pf	200 kW	Amps: 241

STARTING CAPABILITIES (sKVA)

sKVA vs. Voltage Dip

		480 VAC						208/240 VAC					
Alternator	kW	10%	15%	20%	25%	30%	35%	10%	15%	20%	25%	30%	35%
Standard	200	187	280	373	467	560	653	140	210	280	350	420	490
Upsize 1	250	263	395	527	658	790	922	197	296	395	494	593	692
Upsize 2	300	303	454	605	757	908	1059	227	341	454	568	681	794

FUEL CONSUMPTION RATES*

Natural Gas – ft³/hr (m³/hr)

Percent Load	Standby
25%	900 (25.5)
50%	1543 (43.7)
75%	2083 (59.0)
100%	2571 (72.8)

*Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby
Air Flow (inlet air combustion and radiator)	ft³/min (m³/min)	9432 (267)
Coolant System Capacity	gal (L)	6.1 (23.1)
Heat Rejection to Coolant	BTU/hr	670,280
Max. Operating Air Temp on Radiator	°F (°C)	122 (50)
Max. Operating Ambient Temperature (Before Derate)	°F (°C)	104 (40)
Maximum Radiator Backpressure	in H_2O	0.5

COMBUSTION AIR REQUIREMENTS

		Standby
Flow at Rated Power	cfm (m3/min)	432 (12.2)

ENGINE

		Standby
Rated Engine Speed	rpm	1800
Horsepower at Rated kW**	hp	304
Piston Speed	ft/min (m/min)	1949 (594)
BMEP	psi	179

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

EXHAUST

		Standby
Exhaust Flow (Rated Output)	cfm (m³/min)	1499 (42.4)
Max. Backpressure (Post Silencer)	inHg	0.75
Exhaust Temp (Rated Output)	°F (°C)	1384 (751)
Exhaust Outlet Size (Open Set)	in	3.5" I.D. Flex (No Muffler)

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions. Please consult a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528 and DIN6271 standards.

Facility Name:	So Cal Holding, LLC
Address:	20101 Goldenwest Street, Huntington Beach, CA 92648
FIND Date:	1/15/2016
Control #:	84573
Miles from HBEP:	< 3 miles

Application Number	Permit Number	Permit Issued Date	Permit Status	Equipment Type	Equipment Description	Application Date	Application Status	Step 2 - Source Applicability (FIND Data)		Step 3 - Source Applicability (PRR Data)			Source Information			
								Source Included? (Yes or No)	Application Type	PRR Data Received	Source Included? (Yes or No)	Reference of Data for Analysis / Reason for Exclusion from Analysis	Source Make	Source Model	Source Size	Size Units
555370			ACTIVE	Basic	I C E (>500 HP) EM ELEC GEN DIESEL	8/20/2013	PERMIT TO OPERATE GRANTED	Yes	Permit to Construct	Yes	Yes	Addition of an emergency ICE/generator to the Platform Emmy site.	Cummins	QST30-G5NR2	1,490	BHP

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

June 27, 2014

Mark Kapelpke
Vice President, Engineering and Operations
OXY USA, Inc
111 West Ocean Blvd. #800
Long Beach, CA 90802

Dear Mr. Kapelpke,

Attached is your revised RECLAIM Facility Permit for the facility that is located at 20101 Goldenwest Street, Huntington Beach, CA. The Facility Permit reflects your request to add an emergeny ice/generator to the Platform Emmy site.

The following applications are approved for permit to operate and are summarized in the table below.

Application number	Equipment Description	Device number	Process number	System	Section
555370	Emergency ICE/Generator	D228	2	2	D
555402	RECLAIM Amendment				

Please review the attached Section D of the Facility Permit carefully. Any questions pertaining to items in your Facility Permit should be directed to Mr. Hamilton Stoddard at (909) 396-2482 .

Sincerely,

William C. Thompson, P.E.
Senior Enforcement Manager
Engineering and Compliance

WT:MH:hs

5.0 PROPOSED PERMIT TERMS AND CONDITIONS

5.1 Equipment

We request that a permit to construct/ operate be issued with the following proposed wording.

Equipment	ID No.	Connected To	RECLAIM Source Type/Monitoring Unit	Emissions and Requirements	Conditions
EMERGENCY INTERNAL COMBUSTION ENGINE, CUMMINS, MODEL QST30-G5 NR2, SERIAL NO.: 37254511, DIESEL FUELED, 1490 HP, DRIVING AN EMERGENCY ELECTRICAL GENERATOR	Dxx		NOX: PROCESS UNIT	NOX: 14.77 LBS/HR[4] (1)	(1), (2), (3), (4) (as shown below)

5.2 Proposed Conditions

1. THIS ENGINE SHALL NOT OPERATE MORE THAN 200 HOURS IN ANY ONE YEAR.
2. THIS ENGINE SHALL NOT OPERATE MORE THAN 50 HOURS IN ANY ONE YEAR AND 2.7 HOURS IN ANY ONE DAY FOR MAINTENANCE AND TESTING PURPOSES.
3. AN OPERATIONAL NON-RESETTABLE TOTALIZING TIME METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
4. AN ENGINE OPERATING LOG LISTING THE DATE OF OPERATION, THE ELAPSED TIME, IN HOURS, AND THE REASON FOR OPERATION SHALL BE KEPT AND MAINTAINED ON FILE FOR A MINIMUM OF TWO YEARS AND BE MADE AVAILABLE TO THE SCAQMD. PERSONNEL UPON REQUEST.

[4] (4.5 g/bhp-hr) / (454 g/lb) x (1,490 bhp)

Figure 1: OXY USA Inc. Huntington Beach Facility and Surrounding Area

1.2 Application Preparation

This permit application was prepared by Carla Prasetyo Jo and James Adams of Yorke Engineering, LLC. If there are technical questions regarding this application, please contact:

Table 1-2: Application Preparers

Carla Prasetyo Jo, PE	
Yorke Engineering, LLC	
Phone:	(559) 908-6979
Fax:	(949) 248-8499
Cellular:	(559) 908-6979
Email:	cjo@YorkeEngr.com
James Adams, CPP #M6901	
Yorke Engineering, LLC	
Phone:	(949) 248-8490 x231
Fax:	(949) 248-8499
Cellular:	(949) 573-7924
Email:	jadams@YorkeEngr.com

South Coast Air Quality Management District

Form 400-PS

Plot Plan And Stack Information Form

This form must be accompanied by a completed Application for a Permit to Construct/Operate - Form 400A and Form 400-CEQA.

Mail To:
SCAQMD
P.O. Box 4944
Diamond Bar, CA 91765-0944
Tel: (909) 396-3385
www.aqmd.gov

Section A - Operator Information

Facility Name (Business Name of Operator To Appears On The Permit): Oxy USA Inc.

Valid AQMD Facility ID (Available On Permit Or Invoice Issued By AQMD): 169754

Address where the equipment will be operated (for equipment which will be moved to various location in AQMD's jurisdiction, please list the initial location site): Platform Emmy (offshore, Huntington Beach)

(●) Fixed Location ( ) Various Locations

Section B - Location Data

Plot Plan

Please attach a site map for the project with distances and scales. Identify and locate the proposed equipment on the map. A copy of the appropriate Thomas Brothers page, a web-based map, or a sketch that shows the major streets and location of the equipment is acceptable.

Location of Schools Nearby

Is the facility located within a 1/4 mile radius (1,320 feet) of the outer boundary of a school? ( ) Yes (●) No

If yes, please provide name(s) of school(s) below:

School Name: _____ **School Name:** _____

School Address: _____ **School Address:** _____

Distance from stack or equipment vent to the outer boundary of the school: _____ feet

Distance from stack or equipment vent to the outer boundary of the school: _____ feet

CA Health & Safety Code 42301.9: "School" means any public or private school used for purposes of the education of more than 12 children in kindergarten or any of grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.

Population Density

( ) Urban (●) Rural (<50% of land within 3 km radius accounted for by urban land use categories, i.e., multi-family dwelling or industrial.)

Zoning Classification

( ) Mixed Use Residential Commercial Zone (M-U) ( ) Service and Professional Zone (C-S) ( ) Medium Commercial (C-3)

( ) Heavy Commercial (C-4) (●) Commercial Manufacturing (C-M)

Section C - Emission Release Parameters - Stacks, Vents

Stack Data

Stack Height: 75.00 feet (above ground level) **What is the height of the closest building nearest the stack?** 20 feet

Stack Inside Diameter: _____ inches **Stack Flow:** 325,577 acfm **Stack Temperature:** 850 °F

Rain Cap Present: ( ) Yes (●) No **Stack Orientation:** (●) Vertical ( ) Horizontal

If the stack height is less than 2.5 times the closest building height (H), please provide information on any building within 5xH distance from the stack (attach additional sheet if necessary):

Building #/Name: _____ **Building #/Name:** _____

Building Height: _____ feet (above ground level) **Building Height:** _____ feet (above ground level)

Building Width: _____ feet **Building Width:** _____ feet

Building Length: _____ feet **Building Length:** _____ feet

Receptor Distance From Equipment Stack or Roof Vents/Openings

Distance to nearest residence: 7,700 feet **Distance to nearest business:** 7,700 feet

Building Information

Are the emissions released from vents and/or openings from a building? ( ) Yes (●) No

If yes, please provide:

Building #/Name: _____ **Building Width:** _____ feet

Building Height: _____ feet (above ground level) **Building Length:** _____ feet

Generator set data sheet

Model:	**DQFAD**
Frequency:	**60**
Fuel type:	**Diesel**
KW rating:	**1000 standby**
	900 prime
Emissions level:	**EPA NSPS Stationary Emergency Tier 2**

Exhaust emission data sheet:	**EDS-1063**
Exhaust emission compliance sheet:	**EPA-1097**
Sound performance data sheet:	**MSP-1038**
Cooling performance data sheet:	**MCP-156**
Prototype test summary data sheet:	**PTS-266**
Standard set-mounted radiator cooling outline:	**A049K674**
Optional set-mounted radiator cooling outline:	**A053G789**
Optional heat exchanger cooling outline:	
Optional remote radiator cooling outline:	**A053G787**

Fuel consumption

	Standby				Prime				Continuous
	kW (kVA)				kW (kVA)				kW (kVA)
Ratings	1000 (1250)				900 (1125)				
Load	**1/4**	**1/2**	**3/4**	**Full**	**1/4**	**1/2**	**3/4**	**Full**	**Full**
US gph	18.7	36.4	54.2	71.9	16.9	32.4	48.0	63.5	
L/hr	70.6	137.8	205.1	272.3	64.0	122.8	181.5	240.3	

Engine

	Standby rating	Prime rating	Continuous rating
Engine manufacturer	Cummins Inc.		
Engine model	QST30-G5 NR2		
Configuration	Cast iron, V 12 cylinder		
Aspiration	Turbocharged and low temperature aftercooled		
Gross engine power output, kWm (bhp)	1112 (1490)	1007 (1350)	
BMEP at set rated load, kPa (psi)	2417 (351)	2160 (313)	
Bore, mm (in)	140 (5.51)		
Stroke, mm (in)	165 (6.5)		
Rated speed, rpm	1800		
Piston speed, m/s (ft/min)	9.91 (1950)		
Compression ratio	14.7:1		
Lube oil capacity, L (qt)	154 (162.8)		
Overspeed limit, rpm	2100 ±50		
Regenerative power, kW	82		

Fuel flow

Maximum fuel flow, L/hr (US gph)	570 (150)
Maximum fuel inlet restriction, kPa (in Hg)	27 (8.0)
Maximum fuel inlet temperature, °C (°F)	66 (150)

Air

	Standby rating	Prime rating	Continuous rating
Combustion air, m^3/min (scfm)	88 (3150)	81 (2880)	
Maximum air cleaner restriction, kPa (in H_2O)	6.2 (25)		
Alternator cooling air, m^3/min (cfm)	204 (7300)		

Exhaust

Exhaust flow at rated load, m^3/min (cfm)	211 (7540)	195 (6950)	
Exhaust temperature, °C (°F)	477 (890)	467 (873)	
Maximum back pressure, kPa (in H_2O)	6.8 (27)		

Standard set-mounted radiator cooling

Ambient design, °C (°F)	56 (132.8)		
Fan load, kW_m (HP)	33.1 (44.4)		
Coolant capacity (with radiator), L (US gal)	167(44)		
Cooling system air flow, m^3/min (scfm)	1097.5 (38753)		
Total heat rejection, MJ/min (Btu/min)	48.9 (46455)	43.9 (41660)	
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)		
Maximum fuel return line restriction kPa (in Hg)	67.5 (20)		

Optional set-mounted radiator cooling (Cu/Br)

Ambient design, °C (°F)	50 (122)		
Fan load, kW_m (HP)	43 (57)		
Coolant capacity (with radiator), L (US gal)	201 (53.2)		
Cooling system air flow, m^3/min (scfm)	962 (34000)		
Total heat rejection, MJ/min (Btu/min)	48.9 (46455)	43.9 (41660)	
Maximum cooling air flow static restriction, kPa (in H_2O)	0.12 (0.5)		
Maximum fuel return line restriction kPa (in Hg)	67.5 (20)		

Optional heat exchanger cooling

Set coolant capacity, L (US gal)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum raw water pressure, jacket water circuit, kPa (psi)			
Maximum raw water pressure, aftercooler circuit, kPa (psi)			
Maximum raw water pressure, fuel circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US gal/min)			
Maximum raw water flow, aftercooler circuit, L/min (US gal/min)			
Maximum raw water flow, fuel circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US gal/min)			
Raw water delta P at min flow, jacket water circuit, kPa (psi)			
Raw water delta P at min flow, aftercooler circuit, kPa (psi)			
Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum jacket water outlet temp, °C (°F)			
Maximum aftercooler inlet temp, °C (°F)			
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			
Maximum fuel return line restriction, kPa (in Hg)			

Optional remote radiator cooling[1]	Standby rating	Prime rating	Continuous rating
Set coolant capacity, L (US gal)			
Max flow rate at max friction head, jacket water circuit, L/min (US gal/min)	992 (262)		
Max flow rate at max friction head, aftercooler circuit, L/min (US gal/min)	303 (80)		
Heat rejected, jacket water circuit, MJ/min (Btu/min)	22.67 (21500)	21.01 (19925)	
Heat rejected, aftercooler circuit, MJ/min (Btu/min)	18.35 (17400)	15.69 (14885)	
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)	6.1 (5753)	5.6 (5301)	
Maximum friction head, jacket water circuit, kPa (psi)	69 (10)		
Maximum friction head, aftercooler circuit, kPa (psi)	48 (7)		
Maximum static head, jacket water circuit, m (ft)	14 (46)		
Maximum static head, aftercooler circuit, m (ft)	14 (46)		
Maximum jacket water outlet temp, °C (°F)	104 (220)	100 (212)	
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)	41 (105)		
Maximum aftercooler inlet temp, °C (°F)	62 (143)	56 (133)	
Maximum fuel flow, L/hr (US gph)			
Maximum fuel return line restriction, kPa (in Hg)	67.5 (20)		

Weights[2]

Unit dry weight kgs (lbs)	7594 (16742)
Unit wet weight kgs (lbs)	7857 (17322)

Notes:
[1] For non-standard remote installations contact your local Cummins Power Generation representative.
[2] Weights represent a set with standard features. See outline drawing for weights of other configurations.

Derating factors

Standby	Engine power available up to 701 m (2300 ft) at ambient temperatures up to 40 °C (104 °F). Above these elevations, derate at 3.5% per 305 m (1000 ft) and 7% per 10 °C (18 °F).
Prime	Engine power available up to 727 m (2385 ft) at ambient temperatures up to 40 °C (104 °F). Above these elevations, derate at 3.5% per 305 m (1000 ft) and 7% per 10 °C (18 °F).
Continuous	

Ratings definitions

Emergency standby power (ESP):	Limited-time running power (LTP):	Prime power (PRP):	Base load (continuous) power (COP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271 and BS 5514.

Alternator data

Voltage	Connection[1]	Temp rise degrees C	Duty[2]	Single phase factor[3]	Max surge kVA[4]	Surge kW	Alternator data sheet	Feature Code
120/208-139/240	12-lead	125/105	S/P		4234	1019	ADS-312	B252
240/416-277/480	12-lead	125/105	S/P		4234	1019	ADS-312	B252
277/480	Wye, 3-phase	125/105	S/P		3866	1018	ADS-311	B276
220/380-277/480	Wye, 3-phase	125/105	S/P		4602	1018	ADS-330	B282
220/380-277/480	Wye, 3-phase	105/80	S/P		4602	1018	ADS-330	B283
210/380-277/480	Wye, 3-phase	80	S		5521	1024	ADS-331	B284
240/416-277/480	Wye	125/105	S/P		4234	1019	ADS-312	B288
347/600	3-phase	125/105	S/P		3866	1021	ADS-311	B300
347/600	3-phase	105/80	S/P		4234	1024	ADS-312	B301
347/600	3-phase	80	S		4602	1004	ADS-330	B604

Notes:

[1] Limited single phase capability is available from some three phase rated configurations. To obtain single phase rating, multipy the three phase kW rating by the Single Phase Factor[3]. All single phase ratings are at unity power factor.

[2] Standby (S), Prime (P) and Continuous ratings (C).

[3] Factor for the *Single Phase Output from Three Phase Alternator* formula listed below.

[4] Maximum rated starting kVA that results in a minimum of 90% of rated sustained voltage during starting.

Formulas for calculating full load currents:

Three phase output

$$\frac{\text{kW} \times 1000}{\text{Voltage} \times 1.73 \times 0.8}$$

Single phase output

$$\frac{\text{kW} \times \text{SinglePhaseFactor} \times 1000}{\text{Voltage}}$$

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

North America
1400 73rd Avenue N.E.
Minneapolis, MN 55432
USA

Phone 763 574 5000
Fax 763 574 5298

Our energy working for you. ™

D-3332j (06/16)

power.cummins.com

NSR DATA SUMMARY SHEET

Application No	555370
Application Type	10
Application status	PENDAPPRV
Previous Apps, Dev	,

Company Name	OXY USA INC
Company ID	169754
Address	20101 GOLDENWEST ST, HUNTINGTON BEACH, CA 92648-2628
Reclaim	NOX
Reclaim Zone	01
Air Basin	SC
Zone	18
Title V	NO

Device ID	0 -
Estimated Completion Date	02-28-2014
Heat Input Capacity	0 Millions BTU/Hr
Priority Reserve	NONE - No Priority Access Requested
Recommended Disposition	31 - PERMIT TO OPERATE GRANTED
PR Expiration	12-31-9999
School within 1,000 feet	NO
Operating Weeks per year	50
Operating Days per week	1
Operating Hours	
Monday	08:00 to 09:00
Tuesday	00:00 to 00:00
Wednesday	00:00 to 00:00
Thursday	00:00 to 00:00
Friday	00:00 to 00:00
Saturday	00:00 to 00:00
Sunday	00:00 to 00:00

Emittant	CO	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0.3	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	2.16	Lbs/Hr
Max Daily	2.16	Lbs/day
Uncontrolled Emission		
Max Hourly	2.16	Lbs/Hr
Max Daily	2.16	Lbs/day
Current Emission		
BACT 30 Day Avg	0.30	Lbs/day
Annual Emission	108.00	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Emittant	CO2	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	80614.63	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	1,612.29	Lbs/Hr
Max Daily	1,612.29	Lbs/day
Uncontrolled Emission		
Max Hourly	1,612.29	Lbs/Hr
Max Daily	1,612.29	Lbs/day
Current Emission		
BACT 30 Day Avg		Lbs/day
Annual Emission	80,614.63	Lbs/year
District Emission		

Emittant	CO2e	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	80890.002999999	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly		Lbs/Hr
Max Daily		Lbs/day
Uncontrolled Emission		
Max Hourly		Lbs/Hr
Max Daily		Lbs/day
Current Emission		
BACT 30 Day Avg		Lbs/day
Annual Emission	80,890.00	Lbs/year
District Emission		

Emittant	GHG	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	80618.607	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly		Lbs/Hr
Max Daily		Lbs/day
Uncontrolled Emission		
Max Hourly		Lbs/Hr
Max Daily		Lbs/day
Current Emission		
BACT 30 Day Avg		Lbs/day
Annual Emission	80,618.61	Lbs/year
District Emission		

Emittant	METHANE	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	3.31	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.07	Lbs/Hr
Max Daily	0.07	Lbs/day
Uncontrolled Emission		
Max Hourly	0.07	Lbs/Hr
Max Daily	0.07	Lbs/day
Current Emission		
BACT 30 Day Avg		Lbs/day
Annual Emission	3.31	Lbs/year
District Emission		

Emittant	N2O	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0.66	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.01	Lbs/Hr
Max Daily	0.01	Lbs/day
Uncontrolled Emission		
Max Hourly	0.01	Lbs/Hr
Max Daily	0.01	Lbs/day
Current Emission		
BACT 30 Day Avg		Lbs/day
Annual Emission	0.66	Lbs/year
District Emission		

Emittant	NOX	
BACT		
Cost effectiveness	NO	
Source Type	MAJOR	
Emis Increase	1.8	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	12.98	Lbs/Hr
Max Daily	12.98	Lbs/day
Uncontrolled Emission		
Max Hourly	12.98	Lbs/Hr
Max Daily	12.98	Lbs/day
Current Emission		
BACT 30 Day Avg	1.80	Lbs/day
Annual Emission	648.80	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Emittant	PM10	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0.05	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.36	Lbs/Hr
Max Daily	0.36	Lbs/day
Uncontrolled Emission		
Max Hourly	0.36	Lbs/Hr
Max Daily	0.36	Lbs/day
Current Emission		
BACT 30 Day Avg	0.05	Lbs/day
Annual Emission	18.10	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Emittant	ROG	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0.32	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.23	Lbs/Hr
Max Daily	0.23	Lbs/day
Uncontrolled Emission		
Max Hourly	0.23	Lbs/Hr
Max Daily	0.23	Lbs/day
Current Emission		
BACT 30 Day Avg	0.32	Lbs/day
Annual Emission	11.50	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Emittant	SOX	
BACT		
Cost effectiveness	NO	
Source Type	MINOR	
Emis Increase	0	
Modelling	N/A	
Public Notice	N	
Controlled Emission		
Max Hourly	0.02	Lbs/Hr
Max Daily	0.02	Lbs/day
Uncontrolled Emission		
Max Hourly	0.02	Lbs/Hr
Max Daily	0.02	Lbs/day
Current Emission		
BACT 30 Day Avg	0.00	Lbs/day
Annual Emission	0.80	Lbs/year
District Emission	1304(a)(4) - 10-12-1995	

Supervisor's Approval NVH Supervisor's Review Date 7/1/14

Attachment A6-3
Summary of Dispersion Modeling Parameters and Results

Huntington Beach Energy Project
Attachment A6-3 Table 1
Cumulative Modeling Parameters - Stack Parameters
August 2016

Point Sources

Facility	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
HBEP (CO, 1-hour NO_2 [state], 1-hour SO_2)	GE 7FA.05-01 Scenario 3	409449	3723146	3.66	45.7	350	12.2	6.10
	GE 7FA.05-02 Scenario 3	409474	3723182	3.66	45.7	350	12.2	6.10
HBEP (24-hour PM_{10}, 24-hour $PM_{2.5}$) [a]	GE 7FA.05-01 Scenario 6	409449	3723146	3.66	45.7	353	14.9	6.10
HBEP (1-hour NO_2 [federal], Annual NO_2, 3-hour SO_2, 24-hour SO_2, PM_{10}, $PM_{2.5}$) [a]	GE 7FA.05-01 Scenario 7	409449	3723146	3.66	45.7	350	11.8	6.10
	GE 7FA.05-02 Scenario 7	409474	3723182	3.66	45.7	350	11.8	6.10
HBEP (1-hour SO_2)	GE LMS 100PB-01 Scenario 1	409149	3723193	3.66	24.4	694	33.3	4.11
	GE LMS 100PB-02 Scenario 1	409185	3723168	3.66	24.4	694	33.3	4.11
HBEP (CO, 1-hour NO_2 [state])	GE LMS 100PB-01 Scenario 3	409149	3723193	3.66	24.4	748	23.8	4.11
	GE LMS 100PB-02 Scenario 3	409185	3723168	3.66	24.4	748	23.8	4.11
HBEP (3-hour SO_2, 24-hour SO_2)	GE LMS 100PB-01 Scenario 4	409149	3723193	3.66	24.4	697	33.1	4.11
	GE LMS 100PB-02 Scenario 4	409185	3723168	3.66	24.4	697	33.1	4.11
HBEP (Annual NO_2)	GE LMS 100PB-01 Scenario 6	409149	3723193	3.66	24.4	709	28.4	4.11
	GE LMS 100PB-02 Scenario 6	409185	3723168	3.66	24.4	709	28.4	4.11
HBEP (1-hour NO_2 [federal], PM_{10}, $PM_{2.5}$)	GE LMS 100PB-01 Scenario 7	409149	3723193	3.66	24.4	748	23.6	4.11
	GE LMS 100PB-02 Scenario 7	409185	3723168	3.66	24.4	748	23.6	4.11
HBEP (All Pollutants)	Auxiliary Boiler	409438	3723236	3.66	24.4	432	21.2	0.91
OC Sanitation 1	OC11	412725	3728250	7.65	18.9	533	22.0	0.76
	OC12	412725	3728250	7.65	12.8	455	9.29	0.46
	OC13	412608	3728568	7.65	9.14	Ambient	2.72	0.51
OC Sanitation 2	OC22	411100	3722400	1.60	8.48	587	33.9	0.39
Arlon Graphics	AG	414875	3730325	13.5	7.62	364	24.5	1.32
HBC Water Department	HBW	407680	3727679	20.0	4.57	875	36.5	0.20
Fabrica	FAB1	415575	3729816	12.0	0.00	Ambient	13.4	0.10
	FAB2	415575	3729816	12.0	4.57	1,024	114	0.089
So Cal Holding	SCH	403156	3725201	0.00	22.9	750	70.2	0.25

[a] Consistent with Table 5.1-26 of the PTA submitted to CEC on April 6, 2016, the 24-hour $PM_{10/2.5}$ concentration is based on one General Electric (GE) 7FA.05 turbine operating 24 hours per day at minimum load and one GE 7FA.05 turbine operating 20 hours per day at minimum load and 4 hours per day at average load.

Huntington Beach Energy Project
Attachment A6-3 Table 2
Cumulative Modeling Parameters - Emission Rates
August 2016

Emission Rates for 1-hour, 3-hour, 8-hour, and 24-hour Modeling

	State 1-hour NO_2		Federal 1-hour NO_2		1-hour CO		8-hour CO		1-hour SO_2		Federal 1-hour SO_2		3-hour SO_2		24-hour SO_2		24-hour PM_{10}		24-hour $PM_{2.5}$	
Source ID	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
GE 7FA.05-01	7.69	61.0	7.18	57.0	41.0	325	14.9	118	0.37	2.95	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE 7FA.05-02	7.69	61.0	7.18	57.0	41.0	325	14.9	118	0.37	2.95	0.37	2.95	0.35	2.79	0.35	2.79	1.07	8.50	1.07	8.50
GE LMS 100PB-01	2.67	21.2	2.67	21.2	5.66	44.9	1.89	15.0	0.20	1.63	0.20	1.63	0.21	1.64	0.21	1.64	0.79	6.24	0.79	6.24
GE LMS 100PB-02	2.67	21.2	2.67	21.2	5.66	44.9	1.89	15.0	0.20	1.63	0.20	1.63	0.21	1.64	0.21	1.64	0.79	6.24	0.79	6.24
Auxiliary Boiler	0.054	0.42	0.054	0.42	0.36	2.83	0.30	2.37	0.018	0.14	0.018	0.14	0.018	0.14	0.0057	0.046	0.020	0.16	0.020	0.16
OC11	0.19	1.49	0.19	1.49	0.18	1.40	0.18	1.40	0.0060	0.048	0.0060	0.048	0.0060	0.048	0.0060	0.048	0.020	0.16	0.020	0.16
OC12	0.03	0.22	0.03	0.22	0.11	0.90	0.11	0.90	0.016	0.13	0.016	0.13	0.016	0.13	0.016	0.13	0.0071	0.056	0.0071	0.056
OC13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0016	0.013	0.0016	0.013
OC22	5.63	44.7	-	-	6.93	55.0	2.60	20.6	0.15	1.19	-	-	0.15	1.19	0.019	0.15	0.041	0.32	0.041	0.32
AG	-	-	-	-	0.042	0.34	0.042	0.34	0.00026	0.0021	0.00026	0.0021	0.00026	0.0021	0.00026	0.0021	0.0021	0.017	0.0021	0.017
HBW	0.24	1.93	0.24	1.93	0.33	2.58	0.040	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00032	0.0025	0.00032	0.0025
FAB1	0.17	1.37	0.17	1.37	-	-	-	-	-	-	-	-	-	-	-	-	0.00020	0.0016	0.00020	0.0016
FAB2	0.0018	0.014	0.0018	0.014	0.0050	0.040	0.0050	0.040	0.00069	0.0055	0.00069	0.0055	0.00069	0.0055	0.00069	0.0055	0.016	0.13	0.016	0.13
SCH	1.64	13.0	1.64	13.0	0.27	2.16	0.034	0.27	0.0025	0.020	0.0025	0.020	0.00084	0.0067	0.00010	0.00083	0.0019	0.015	0.0019	0.015

Emission Rates for Annual Modeling

	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
Source ID	(g/s)	(tpy)	(g/s)	(tpy)	(g/s)	(tpy)
GE 7FA.05-01	1.06	36.7	0.81	28.2	0.81	28.2
GE 7FA.05-02	1.06	36.7	0.81	28.2	0.81	28.2
GE LMS 100PB-01	0.27	9.25	0.18	6.24	0.18	6.24
GE LMS 100PB-02	0.27	9.25	0.18	6.24	0.18	6.24
Auxiliary Boiler	0.019	0.66	0.019	0.68	0.019	0.68
OC11	0.19	6.52	0.020	0.70	0.020	0.70
OC12	0.046	1.60	0.017	0.60	0.017	0.60
OC13	-	-	0.00011	0.0037	0.00011	0.0037
OC22	0.15	5.38	0.0049	0.17	0.0049	0.17
AG	-	-	0.0021	0.073	0.0021	0.073
HBW	0.0014	0.049	0.000040	0.0014	0.000040	0.0014
FAB1	0.17	5.98	0.00020	0.0070	0.00020	0.0070
FAB2	0.0018	0.061	0.016	0.57	0.016	0.57
SCH	0.0092	0.32	0.00026	0.0091	0.00026	0.0091

Cumulative Modeling Parameters - Stack Parameters
Attachment A6-3 Table 3
Cumulative Modeling Results
August 2016

		NO_2 ($\mu g/m^3$) [a]			CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)				PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
Source Group	Year	1-hour	Federal 1-hour [b]	Annual	1-hour	8-hour	1-hour	Federal 1-hour [c]	3-hour	24-hour	24-hour [d]	Annual	24-hour [d, e]	Annual
ALL	2010	127.4	150	3.31	594	139.7	5.62	4.97	4.52	1.55	4.64	0.56	2.72	0.56
	2011	115.5	145	3.35	569	131.7	5.45	4.84	4.68	1.25	3.70	0.57	2.67	0.57
	2012	132.2	138	3.21	600	149.0	5.76	5.01	5.29	1.67	4.98	0.62	2.90	0.62
	2013	111.0	144	3.35	591	130.2	5.67	5.16	4.90	1.30	3.89	0.63	3.20	0.63
	2014	134.1	146	3.22	631	133.9	6.03	5.15	4.92	1.59	4.77	0.64	3.28	0.64
HBEP	2010	89.0	75.4	0.51	594	139.7	5.62	4.97	4.52	1.54	4.63	0.56	2.72	0.56
	2011	85.2	71.0	0.51	569	131.6	5.45	4.84	4.68	1.25	3.69	0.56	2.67	0.56
	2012	89.8	73.2	0.56	600	148.9	5.76	5.01	5.29	1.67	4.97	0.61	2.90	0.61
	2013	88.5	74.1	0.58	591	130.1	5.67	5.16	4.90	1.30	3.89	0.63	3.19	0.63
	2014	94.5	76.0	0.59	631	133.9	6.03	5.15	4.92	1.59	4.76	0.64	3.28	0.64

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 and 0.75, respectively.
[b] Total predicted concentration for the Federal 1-hour NO_2 standard (source ALL) is the high-8th-high modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations for 2010 - 2012.
[c] Total predicted concentration for the Federal 1-hour SO_2 standard is the high-4th-high modeled concentration.
[d] Consistent with Table 5.1-26 of the PTA submitted to CEC on April 6, 2016, the 24-hour $PM_{10/2.5}$ concentration is based on one GE 7FA.05 turbine operating 24 hours per day at minimum load and one GE 7FA.05 turbine operating 20 hours per day at minimum load and 4 hours per day at average load.
[e] Total predicted concentration for the 24-hour $PM_{2.5}$ standard is the high-8th-high modeled concentration.