STOEL RIVES LLP
ATTORNEYS AT LAW

500 Capitol Mall, Suite 1600
Sacramento, CA 95814
main 916.447.0700
fax 916.447.4781
www.stoel.com

May 17, 2013

KIMBERLY J. HELLWIG
Direct (916) 319-4742
kjhellwig@stoel.com

VIA EMAIL

Ms. Felicia Miller, Siting Project Manager
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Re: Huntington Beach Energy Project (12-AFC-02)
Applicant's Responses to Data Requests, Set 4, #104-106 (Air Quality)

Dear Ms. Miller:

On April 15, 2013, California Energy Commission Staff issued Data Requests, Set 4 (#104-106) ("Staff's Data Requests") related to air quality. Applicant's consultant, Robert Mason of CH2M Hill, Inc., informed you on May 15, 2013 that due to delays with the modeling applications, Applicant's responses to Staff's Data Requests would be docketed and served on or before May 17, 2013.

To that end, please find enclosed herein Applicant's responses to the aforementioned requests. In addition, Applicant is submitting concurrently herewith disks that contain modeling files related to the above-referenced responses, as well as Applicant's responses to Data Requests, Set 5 (submitted separately). Due to the formatting of and software required to access the modeling files, Applicant will serve to the parties on the enclosed proof of service only the written responses. Should any party wish to obtain a copy of the modeling files, Applicant will provide such files upon request.

Very truly yours,

Kimberly J. Hellwig
Energy & Environmental Policies Specialist
KJH:jmw
Enclosures
cc: Proof of Service List

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION FOR THE HUNTINGTON BEACH ENERGY PROJECT

Docket No. 12-AFC-02

PROOF OF SERVICE
(Revised 03/26/2013)

SERVICE LIST:

APPLICANT
AES Southland Development, LLC
Stephen O'Kane
Jennifer Didlo
690 Studebaker Road
Long Beach, CA 90803
stephen.okane@aes.com
jennifer.didlo@aes.com

APPLICANT'S CONSULTANTS
CH2MHill
Robert Mason
Project Manager
6 Hutton Centre Drive, Suite 700
Santa Ana, CA 92707
robert.mason@CH2M.com

APPLICANT'S COUNSEL
Melissa A. Foster
Stoel Rives, LLP
500 Capitol Mall, Suite 1600
Sacramento, CA 95814
mafoster@stoel.com

INTERVENOR
Jason Pyle
9071 Kapaa Drive
Huntington Beach, CA 92646
jasonpyle@me.com

INTERESTED AGENCIES
California ISO
e-recipient@caiso.com

INTERESTED AGENCIES (Cont'd.)
California Coastal Commission
Tom Luster
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219
tluster@coastal.ca.gov

California State Parks
Huntington State Beach
Brian Ketterer
21601 Pacific Coast Highway
Huntington Beach, CA 92646
bketterer@parks.ca.gov

City of Huntington Beach
Planning & Building Department
Jane James
Scott Hess
Aaron Klemm
2000 Main Street, 3rd floor
Huntington Beach, CA 92648
jjames@surfcity-hb.org
shess@surfcity-hb.org
aaron.klemm@surfcity-hb.org

City of Huntington Beach
City Council
Cathy Fikes
Johanna Stephenson
2000 Main Street, 4th floor
Huntington Beach, CA 92648
cfikes@surfcity-hb.org
johanna.stephenson@surfcity-hb.org.

INTERESTED AGENCIES (Cont'd.)
Santa Ana Regional
Water Quality Board
Gary Stewart
3737 Main Street, Suite 500
Riverside, CA 92501-3339
gstewart@waterboards.ca.gov

Huntington Beach
Wetlands Conservancy
Jack Kirkorn, Director
21900 Pacific Coast Highway
Huntington Beach, CA 92646
jfk0480@aol.com

ENERGY COMMISSION STAFF
Felicia Miller
Project Manager
felicia.miller@energy.ca.gov

Kevin W. Bell
Staff Counsel
kevin.w.bell@energy.ca.gov

ENERGY COMMISSION – PUBLIC ADVISER
Blake Roberts
Assistant Public Adviser
publicadviser@energy.ca.gov

COMMISSION DOCKET UNIT
California Energy Commission – Docket Unit
Attn: Docket No. 12-AFC-02
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.ca.gov

*indicates change

OTHER ENERGY COMMISSION PARTICIPANTS (LISTED FOR CONVENIENCE ONLY):

After docketing, the Docket Unit will provide a copy to the persons listed below. Do not send copies of documents to these persons unless specifically directed to do so.

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Patrick Saxton
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Galen Lemei
Adviser to Commissioner Douglas

Jennifer Nelson
Adviser to Commissioner Douglas

Eileen Allen
Commissioners' Technical
Adviser for Facility Siting

DECLARATION OF SERVICE

I, Judith M. Warmuth, declare that on May 17, 2013, I served and filed copies of the attached Applicant's Responses to Data Requests, Set 4, #104-106 (Air Quality) dated May 17, 2013. This document is accompanied by the most recent Proof of Service, which I copied from the web page for this project at: http://www.energy.ca.gov/sitingcases/huntington_beach_energy/index.html.

The document has been sent to the other parties on the Service List above in the following manner:

(*Check one*)

For service to all other parties and filing with the Docket Unit at the Energy Commission:

☒ I e-mailed the document to all e-mail addresses on the Service List above and personally delivered it or deposited it in the US mail with first class postage to those parties noted above as "hard copy required"; **OR**

☐ Instead of e-mailing the document, I personally delivered it or deposited it in the US mail with first class postage to all of the persons on the Service List for whom a mailing address is given.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct, and that I am over the age of 18 years.

Dated: May 17, 2013

Judith M. Warmuth

Huntington Beach Energy Project

(12-AFC-02)

Data Responses, Set 4

(Response to Data Requests 104 to 106)

Submitted to

California Energy Commission

Prepared by

AES Southland Development, LLC

With Assistance from

CH2MHILL®
2485 Natomas Park Drive
Suite 600
Sacramento, CA 95833

May 17, 2013

Contents

Introduction

Attached are AES Southland Development, LLC's (AES or the Applicant) responses to the California Energy Commission (CEC) Staff's Data Requests, Set 4 (Air Quality Modeling, requests 104 through 106) regarding the Huntington Beach Energy Project (HBEP) (12-AFC-02) Application for Certification (AFC).

The responses are presented in the same order as CEC Staff presented them and are keyed to the Data Request numbers. New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 104 would be numbered Table DR104-1. The first attachment used in response to Data Request 104 would be Attachment DR104-1, and so on.

Additional tables, figures, or documents submitted in response to a data request (for example, supporting data or stand-alone documents such as plans, folding graphics, etc.) are found at the end of the section and may not be sequentially numbered.

Air Quality (104–106)

BACKGROUND

The 3-year meteorological dataset used in the AFC and in several subsequent data responses has too many calm wind periods, which results in more than 10 percent missing hours when used in AERMOD. Staff usually accepts a maximum of 10 percent missing meteorological data, consistent with U.S. Environmental Protection Agency (EPA) guidance. The South Coast Air Quality Management District (SCAQMD) recently prepared a new, 5-year meteorological dataset which meets EPA and SCAQMD requirements. In addition, the Applicant has been using an ambient nitrogen dioxide (NO_2) ratio of 0.8 in the Plume Volume Molar Ratio Method (PVMRM) option to model for compliance with the Federal 1-hour NO_2 ambient air quality standard. It is Staff's understanding that an ambient NO_2 ratio of 0.9 should be used according to EPA guidance unless a different ratio can be justified.

DATA REQUEST

104. Please update all the modeling submitted on the project to date by using the new, 5-year meteorological dataset provided by SCAQMD. The updated modeling should include construction modeling, commissioning modeling, operation modeling, and overlap periods as well as cumulative impact modeling.

Response: The Applicant herein clarifies that the meteorological dataset used for air dispersion modeling submitted with the AFC, which the Applicant also relied on in compiling responses to previous data requests issued by CEC Staff, was approved by the SCAQMD.[1] In such earlier requests, Staff asked the Applicant to "verify that the currently-used meteorology files with high missing data percentages have been approved by the [SCAQMD] to model project impacts."[2] On November 2, 2012, the Applicant responded to Staff's inquiry, explaining as follows:

> As Staff has correctly noted and as discussed in the Applicant's dispersion modeling protocol submitted to the CEC and [SCAQMD] for review, the Applicant accessed the [SCAQMD's] website to download the AERMOD-ready surface and profile meteorological data files used in the HBEP air quality impact analysis. The [SCAQMD's] website notes the meteorological data are available for download free of charge and that the data are ready for use with the EPA dispersion model, AERMOD, without any additional processing. As a result, no additional data processing was conducted with the exception of separating the combined 3-year data file into three individual years. However, the Applicant notes that both the "calm" and "missing" hours appear to have been categorized as "missing" hours in the AERMOD output files. Although AERMOD considers calm and missing hours the same when calculating downwind concentrations, this combined approach would give the appearance that the data set is less complete than it would be if the calm hours were considered separately in the data completeness count.[3]

On January 18, 2013, the SCAQMD requested that the Applicant use a 5-year meteorological dataset with a commitment that the SCAQMD would provide the meteorological dataset.[4] The SCAQMD subsequently provided such data to the Applicant on January 24, 2013. After the Applicant reviewed the data and requested additional information on February 6, 2013 and February 19, 2013 from the SCAQMD, the SCAQMD finalized the current, 5-year meteorological dataset on February 28, 2013, a copy of which was provided to the Applicant on that same date. Both the Applicant and CEC Staff relied on the SCAQMD's previously-approved meteorological data.

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[1] See AFC Tables 5.1-25 and 5.1-31, which reference communications between Applicant's consultant and SCAQMD Staff Tom Chico and Brian Yeh (May 15, 2012). Applicant requests that all previously provided modeling and analysis related to this issue remain part of the HBEP AFC record.

[2] See Staff's Data Request Set 1, Data Request 3 (October 2, 2012).

[3] See Applicant's Responses to Staff's Data Responses, Set 1A, pp. 3-4 (November 12, 2012).

[4] See CEC Docket TN69700.

Notwithstanding the foregoing, below is Applicant's response to Staff's Data Request 104 using the SCAQMD's most current, 5-year meteorological dataset.

Dispersion Modeling Analysis: Dispersion modeling has been updated as requested by CEC Staff. In addition to the use of the 5-year preprocessed SCAQMD Costa Mesa Station AERMET (Version 12345) meteorological dataset, as recommended by CEC Staff, the following changes have been made to the dispersion modeling methodology:

- Ambient monitored background data from the Costa Mesa monitoring station have been updated to 2009, 2010, and 2011 to reflect the most recent three years available from the SCAQMD.
- Modeling of 1-hour NO_2 was performed using the EPA-recommended Tier 2 oxides of nitrogen (NO_x) to NO_2 ambient ratio of 0.8.
- Modeling scenarios that were expected to have high 1-hour NO_2 impacts were refined by adding the 98th percentile seasonal, hour-of-day background NO_2 concentrations to the modeled impacts for compliance with the National Ambient Air Quality Standards (NAAQS). Background concentrations were provided by the SCAQMD for years 2009 through 2011.
- Modeling parameters for fugitive dust area sources were revised based on the EPA memorandum, *Haul Road Workgroup Final Report Submission to EPA-OAQPS* (EPA, 2012). The release height of fugitive dust sources was set to ground level (0 meters), and the initial vertical dimension set to 1 meter.

Wind roses and wind tables for the 5-year Costa Mesa meteorological dataset are presented in Attachment DR104-1.

Construction Impacts Analysis. The dispersion modeling for the HBEP construction impacts analysis followed the methodology outlined in Workshop Query 1, which was submitted to the CEC on March 13, 2013, with the refinements noted above. Table DR104-1, which is a revision to Workshop Queries Table WSQ1-13, indicates that the maximum NO_2, sulfur dioxide (SO_2), and carbon monoxide (CO) construction impacts combined with the background concentrations will be below the ambient air quality standards (AAQS) for each averaging period.

The annual and 24-hour particulate matter with aerodynamic diameter less than or equal to 10 microns (PM_{10}) background concentrations exceed the state AAQS without adding the modeled concentrations. Similarly, the particulate matter with aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$) modeled concentrations are nearly equal to or exceed the AAQS without adding the background concentrations. As a result, the predicted PM_{10} and $PM_{2.5}$ impacts will be greater than the AAQS without mitigation. Based on the modeling analysis, fugitive dust is a significant contributor to the predicted concentrations, but the maximum PM_{10} and $PM_{2.5}$ concentrations will remain near the property boundary. The implementation of previously identified construction mitigation measures (presented in AFC Section 5.1.8.1, Construction Mitigation) is expected to reduce the offsite construction air quality impacts to less-than-significant levels.

A summary of the dispersion modeling input files for this scenario, as well as the complete modeling results, are presented in Attachment DR104-2. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-1
Maximum Modeled Impacts from Construction and the Ambient Air Quality Standards

Pollutant	Averaging Period	Maximum Modeled Concentration (µg/m^3)	Background Concentration [a] (µg/m^3)	Total Predicted Concentration (µg/m^3)	State Standard (µg/m^3)	Federal Standard (µg/m^3)
NO_2 [b]	1-hour	73.4	132	205	339	—
	Federal 1-hour [c]	-	-	166	—	188
	Annual	6.67	24.5	31.2	57	100
SO_2	1-hour	0.17	26.2	26.4	655	—
	Federal 1-hour [d]	0.17	15.7	15.9	—	196
	3-hour	0.16	17.3	17.5	—	1,300
	24-hour	0.042	10.5	10.5	105	365
CO	1-hour	89.6	3,436	3,526	23,000	40,000
	8-hour	78.3	2,519	2,597	10,000	10,000
PM_{10}	24-hour	254	56	310	50	150
	Annual	43.7	23.5	67.2	20	—
$PM_{2.5}$	24-hour [e]	56.0	28.8	84.8	—	35
	Annual	12.3	9.5	21.8	12	12

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011 with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] Total predicted concentration for the Federal 1-hour NO_2 standard is the maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.
[d] Total predicted concentration for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the three-year average of 99th percentile background concentrations.
[e] Total predicted concentration for the Federal 24-hour $PM_{2.5}$ standard is the maximum modeled concentration combined with the three-year average of 98th percentile background concentrations.
µg/m^3 = micrograms per cubic meter

Commissioning Impacts Analysis. The dispersion modeling for the HBEP commissioning impacts analysis followed the methodology outlined in AFC Section 5.1.6.3, Air Quality Impact Analysis, with the refinements noted above. Table DR104-2, which is a revision to AFC Table 5.1-28, indicates that the maximum NO_2 and CO commissioning impacts combined with the background concentrations will be below the AAQS for each averaging period. Short-term SO_2, PM_{10}, and $PM_{2.5}$ impacts were not evaluated for commissioning as emissions of these pollutants are lower during commissioning than for normal operation. Annual impacts were not evaluated as the commissioning schedule is 180 days, and not likely to impact annual AAQS because the turbines are expected to operate less than 500 hours during the commissioning period.

A summary of the dispersion modeling input files for this scenario, as well as the complete modeling results, are presented in Attachment DR104-2. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-2
Turbine Commissioning Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration (µg/m^3)	Background Concentration (µg/m^3) [a]	Total Predicted Concentration (µg/m^3)	State Standard (µg/m^3)	Federal Standard (µg/m^3)
NO_2 [b]	1-hour	204.2	132	336	339	—
CO	1-hour	7,376	3,436	10,812	23,000	40,000
	8-hour	3,391	2,519	5,910	10,000	10,000

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011.
[b] The maximum 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80 (EPA, 2011).

Operation Impacts Analysis. The dispersion modeling for the HBEP operation impacts analysis followed the methodology outlined in AFC Section 5.1.6.3, Air Quality Impact Analysis, with the refinements noted above. The highest modeled concentrations were used to demonstrate compliance with the AAQS. Table DR104-3, which is a revision of AFC Table 5.1-29, presents a comparison of the maximum HBEP operational impacts to the AAQS. The NO_2, CO, SO_2, and $PM_{2.5}$ concentrations combined with the background concentrations do not exceed the AAQS. Therefore, HBEP will not cause or contribute to the violation of a standard and the NO_2, CO, SO_2, and $PM_{2.5}$ impacts from operation will be less than significant.

For PM_{10}, the background concentrations exceed the AAQS without the proposed project, with the exception of the Federal 24-hour standard. As a result, the predicted project impacts plus background also exceed the AAQS and the operation of the proposed project would further contribute to an existing violation of the state standards absent mitigation. As discussed in AFC Section 5.1.8.2, Operational Mitigation, HBEP emissions will be fully offset consistent with SCAQMD Rules 1303 and 1304 using the SCAQMD internal offset bank. Therefore, the PM_{10} impacts from operation will be mitigated to a less-than-significant level.

A complete list of offsite impacts for the multiple turbine operating scenarios is presented in Attachment DR104-2. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-3
HBEP Operation Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$) [a]	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2 [b]	1-hour	29.9	132	162	339	—
	Federal 1-hour [c]	29.9	107	137	—	188
	Annual	1.39	24.5	25.9	57	100
SO_2	1-hour	2.76	26.2	29.0	655	—
	Federal 1-hour [d]	2.76	15.7	18.5	—	196
	3-hour	1.61	17.3	18.9	—	1,300
	24-hour	1.05	10.5	11.5	105	365
CO	1-hour	167	3,436	3,603	23,000	40,000
	8-hour	30.9	2,519	2,550	10,000	10,000
PM_{10}	24-hour	3.79	56	59.8	50	150
	Annual	0.81	23.5	24.3	20	—
$PM_{2.5}$	24-hour [c]	3.79	28.8	32.6	—	35
	Annual	0.81	9.5	10.3	12	12

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011 with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] Total predicted concentrations for the Federal 1-hour NO_2 standard and 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the three-year average of 98th percentile background concentrations.
[d] Total predicted concentration for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the 3-year average of 99th percentile background concentrations.

Rule 2005. Table DR104-4, which is a revision of AFC Table 5.1-30, presents the maximum modeled NO_2 concentrations from the refined dispersion modeling analysis for each turbine compared to the Rule 2005 significance threshold. The maximum modeled NO_2 concentrations were also added to representative background concentrations and the results compared to the state and Federal AAQS for NO_2. Although the NO_2 concentrations per turbine exceed the Rule 2005 1-hour significance threshold, they do not exceed either the state or Federal AAQS. Therefore, the predicted NO_2 impacts from operation will be less than significant per the Rule 2005 requirements.

TABLE DR104-4
Rule 2005 Air Quality Thresholds and Standards Applicable to the Project (per emission unit)

Pollutant/ Averaging Period	Maximum Modeled Impact [a] ($\mu g/m^3$)	Significant Threshold [b] ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$) [c]	Total Predicted Concentration ($\mu g/m^3$)	CAAQS/NAAQS ($\mu g/m^3$)
NO_2 (1-hour)	21.4	20	132	153	339/—
NO_2 (Federal 1-hour)	21.4	—	107	128	—/188
NO_2 (Annual)	0.240	1	24.5	24.7	57/100

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] Allowable change in air quality concentration per emission unit per Rule 2005, Appendix A.
[c] Background concentrations were the highest concentrations monitored during 2009 through 2011.
CAAQS = California Ambient Air Quality Standards
NAAQS = National Ambient Air Quality Standards

Regulation XVII (Prevention of Significant Deterioration [PSD]). Table DR104-5, which is a revision of AFC Table 5.1-31, presents a summary of the predicted hourly and annual NO_2 impacts and a comparison to the Class II modeling significance impact levels (SILs), Class II PSD increments, and the significant monitoring concentration levels. The maximum 1-hour NO_2 concentration exceeds the SIL, with a radius of impact with predicted concentrations greater than 7.52 micrograms per cubic meter ($\mu g/m^3$) of 3.0 kilometers (km). The maximum annual NO_2 concentration exceeds the SIL, with a radius of impact with predicted concentrations greater than 1.0 $\mu g/m^3$ of 1.5 km. An addendum to the HBEP modeling protocol was submitted to the SCAQMD on March 22, 2013[5] to address the competing source and increment modeling required when PSD SILs are predicted to be exceeded by a project. Applicant will conduct additional modeling following approval of the addendum to the HBEP modeling protocol by the SCAQMD.

TABLE DR104-5
HBEP Predicted Impacts Compared to the PSD Air Quality Impact Standards

Averaging Period/ Pollutant	Maximum Predicted Impact ($\mu g/m^3$) [a]	Significance Impact Level ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)	Significant Monitoring Concentrations ($\mu g/m^3$)
NO_2 (1-hour)	29.9	7.52 [b]	NS	NS
NO_2 (Annual)	1.39	1.0	25	14

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] SIL for 1-hour NO_2 is based on SCAQMD correspondence.
NS = no standard

Table DR104-6, which is a revision of AFC Table 5.1-32, presents a summary of the predicted annual NO_2 impacts and a comparison to the Class I Increment thresholds. The predicted impacts from the operation of the HBEP are below the SILs. Therefore, the project would have a negligible impact at the more distant Class I areas.

TABLE DR104-6
HBEP Predicted Impacts Compared to the Class I SIL and Increment Standards

Averaging Period/ Pollutant	Maximum Predicted Impact at 50 km ($\mu g/m^3$)	Significance Impact Level ($\mu g/m^3$)	PSD Increment ($\mu g/m^3$)
NO_2 (Annual)	0.037	0.1	2.5

[5] The air dispersion modeling addendum was submitted to the CEC on March 27, 2013 (see Docket Log 70167).

Cumulative Impacts Analysis. The dispersion modeling for the HBEP cumulative impacts analysis followed the methodology outlined in Data Responses, Set 1B - 11, which was submitted to the CEC on January 17, 2013, with the refinements noted above. Table DR104-7, which is a revision of Data Responses, Set 1B Table DR11-3, presents a comparison of the maximum modeled cumulative impacts with the AAQS. The maximum modeled cumulative NO_2, CO, SO_2, and $PM_{2.5}$ concentrations combined with the background concentrations do not exceed the AAQS. The results of the cumulative modeling analysis also 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 AFC, the existing Huntington Beach Generating Station boiler Units 1 and 2 will be removed after completion of HBEP construction. Therefore, the cumulative sources are not expected to cause or contribute to the violation of a standard and the NO_2, CO, SO_2, and $PM_{2.5}$ impacts will be less than significant.

For PM_{10}, the background concentrations exceed the AAQS without the cumulative sources, with the exception of the Federal 24-hour standard. 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 state standards absent mitigation. As discussed in the AFC, HBEP emissions will be fully offset consistent with SCAQMD Rules 1303 and 1304 using the SCAQMD internal offset bank. Therefore the PM_{10} impacts will be mitigated to a less-than-significant level.

A complete list of offsite impacts for the cumulative impact analysis is presented in Attachment DR104-3. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-7
Cumulative Impacts Analysis—Maximum Modeled Impacts Compared to the Ambient Air Quality Standards

Pollutant	Averaging Time	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$) [a]	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2 [b]	1-hour	29.9	132	162	339	—
	Federal 1-hour [c]	—	—	116	—	188
	Annual	1.53	24.5	26.0	57	100
SO_2	1-hour	2.82	26.2	29.0	655	—
	Federal 1-hour [d]	2.82	15.7	18.5	—	196
	3-hour	3.35	17.3	20.6	—	1,300
	24-hour	1.08	10.5	11.6	105	365
CO	1-hour	167	3,436	3,603	23,000	40,000
	8-hour	48.5	2,519	2,567	10,000	10,000
PM_{10}	24-hour	3.84	56	59.8	50	150
	Annual	0.83	23.5	24.3	20	—
$PM_{2.5}$	24-hour [e]	3.84	28.8	32.6	—	35
	Annual	0.83	9.5	10.3	12	12

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011 with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] Total predicted concentration for the Federal 1-hour NO_2 standard is the maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.
[d] Total predicted concentration for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the three-year average of 99th percentile background concentrations.
[e] Total predicted concentration for the Federal 24-hour $PM_{2.5}$ standard is the maximum modeled concentration combined with the three-year average of 98th percentile background concentration.

Construction Overlap Impacts Analysis. The dispersion modeling for the HBEP construction overlap impacts analysis followed the methodology outlined in Workshop Query 2, which was submitted to the CEC on March 13, 2013, with the refinements noted above. Table DR104-8, which is a revision to Workshop Queries Table WSQ2-1, indicates the maximum NO_2, SO_2, CO, and $PM_{2.5}$ concentrations combined with the background concentrations do not exceed the AAQS. Therefore, Block 1 operation and construction of Block 2 will not cause or contribute to the violation of a standard and the NO_2, SO_2, CO, and $PM_{2.5}$ impacts will be less than significant.

For PM_{10}, the annual and 24-hour background concentrations exceed the state AAQS without adding the modeled concentrations. As a result, the predicted scenario impacts plus background also exceed the state AAQS and would further contribute to an existing violation of the state AAQS without mitigation. The implementation of construction and operation mitigation measures presented in AFC Section 5.1.8, Mitigation Measures, is expected to reduce the PM_{10} impacts to less-than-significant levels.

A summary of the dispersion modeling input files for this scenario, as well as the complete modeling results, are presented in Attachment DR104-4. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-8
Maximum Modeled Impacts from Block 1 Operation and Construction of Block 2 and the Ambient Air Quality Standards

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration [a] ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2	1-hour [b]	49.7	132	182	339	—
	Federal 1-hour [b, c]	49.7	107	157	—	188
	Annual [d]	3.33	24.5	27.8	57	100
SO_2	1-hour	1.41	26.2	27.6	655	—
	Federal 1-hour [e]	1.41	15.7	17.1	—	196
	3-hour	0.85	17.3	18.2	—	1,300
	24-hour	0.54	10.5	11.0	105	365
CO	1-hour	78.9	3,436	3,515	23,000	40,000
	8-hour	41.6	2,519	2,561	10,000	10,000
PM_{10}	24-hour	38.8	56	94.8	50	150
	Annual	9.56	23.5	33.1	20	—
$PM_{2.5}$	24-hour [c]	4.57	28.8	33.4	—	35
	Annual	1.30	9.5	10.8	12	12

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011 with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80 (EPA, 2011).
[c] Total predicted concentrations for the Federal 1-hour NO_2 standard and 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the three-year average of 98th percentile background concentrations.
[d] The maximum annual NO_2 concentration includes an ambient NO_2 ratio of 0.75 (EPA, 2005).
[e] Total predicted concentration for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the three-year average of 99th percentile background concentrations.

Table DR104-9, which is a revision to Workshop Queries Table WSQ2-2, indicates that the maximum NO_2, SO_2, and CO concentrations combined with the background concentrations do not exceed the AAQS. Therefore, operation of HBEP (Blocks 1 and 2) with demolition of Huntington Beach Generating Station Units 1 and 2 will not cause or contribute to the violation of a standard and the NO_2, SO_2, and CO impacts will be less than significant.

For particulate matter, the annual and 24-hour PM_{10} background concentrations exceed the state AAQS without adding the modeled concentrations and the 24-hour PM_{10} and 24-hour $PM_{2.5}$ modeled concentrations exceed the AAQS without adding the background concentrations. As a result, the predicted scenario impacts will be greater than the AAQS without mitigation. Based on the modeling analysis, although fugitive dust is a significant contributor to the predicted concentrations, the maximum PM_{10} and $PM_{2.5}$ concentrations will remain at or near the property boundary and the implementation of construction mitigation measures presented in AFC Section 5.1.8.1, Construction Mitigation, is expected to reduce any offsite construction air quality impacts to less-than-significant levels.

A summary of the dispersion modeling input files for this scenario, as well as the complete modeling results, are presented in Attachment DR104-4. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-9
Maximum Modeled Impacts from HBEP Operation with Demolition of Units 1 and 2 and the Ambient Air Quality Standards

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration [a] ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2	1-hour [b]	66.1	132	198	339	—
	Federal 1-hour [b, c]	66.1	107	173	—	188
	Annual [d]	4.21	24.5	28.7	57	100
SO_2	1-hour	2.77	26.2	29.0	655	—
	Federal 1-hour [e]	2.77	15.7	18.4	—	196
	3-hour	1.62	17.3	18.9	—	1,300
	24-hour	1.05	10.5	11.5	105	365
CO	1-hour	176	3,436	3,612	23,000	40,000
	8-hour	92	2,519	2,611	10,000	10,000
PM_{10}	24-hour	257	56	313	50	150
	Annual	43.3	23.5	66.8	20	—
$PM_{2.5}$	24-hour [c]	48.0	28.8	76.8	—	35
	Annual	7.25	9.5	16.7	12	12

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011 with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour NO_2 concentration includes an ambient NO_2 ratio of 0.80 (EPA, 2011).
[c] Total predicted concentrations for the Federal 1-hour NO_2 standard and 24-hour $PM_{2.5}$ standard are the respective maximum modeled concentrations combined with the three-year average of 98th percentile background concentrations.
[d] The maximum annual NO_2 concentration includes an ambient NO_2 ratio of 0.75 (EPA, 2005).
[e] Total predicted concentration for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the three-year average of 99th percentile background concentrations.

Table DR104-10, which is a revision to Workshop Queries Table WSQ2-3, indicates that the CO, SO_2, and NO_2 concentrations combined with the background concentrations do not exceed the AAQS. Therefore, construction of HBEP and demolition of Huntington Beach Generating Station Units 3 and 4 will not cause or contribute to the violation of a standard, and these impacts will be less than significant.

For particulate matter, the annual and 24-hour PM_{10} background concentrations exceed the state AAQS without adding the modeled concentrations and the $PM_{2.5}$ modeled concentrations are nearly equal to or exceed the AAQS without adding the background concentrations. As a result, the predicted scenario impacts will be greater than the AAQS without mitigation. Based on the modeling analysis, although fugitive dust is a significant contributor to the predicted concentrations, the maximum PM_{10} and $PM_{2.5}$ concentrations will remain at or near the property boundary and the implementation of construction mitigation measures presented in AFC Section 5.1.8.1, Construction Mitigation, is expected to reduce any offsite construction air quality impacts to less-than-significant levels.

A summary of the dispersion modeling input files for this scenario, as well as the complete modeling results, are presented in Attachment DR104-4. The AERMOD input and output files have been separately prepared and are included with this submission on DVDs.

TABLE DR104-10
Maximum Modeled Impacts from HBEP Construction and Demolition of Units 3 and 4 and the Ambient Air Quality Standards

Pollutant	Averaging Period	Maximum Modeled Concentration ($\mu g/m^3$)	Background Concentration [a] ($\mu g/m^3$)	Total Predicted Concentration ($\mu g/m^3$)	State Standard ($\mu g/m^3$)	Federal Standard ($\mu g/m^3$)
NO_2 [b]	1-hour	91.2	132	223	339	—
	Federal 1-hour [c]	-	-	139	—	188
	Annual	7.66	24.5	32.2	57	100
SO_2	1-hour	0.23	26.2	26.4	655	—
	Federal 1-hour [d]	0.23	15.7	15.9	—	196
	3-hour	0.21	17.3	17.5	—	1,300
	24-hour	0.056	10.5	10.6	105	365
CO	1-hour	105	3,436	3,541	23,000	40,000
	8-hour	92.1	2,519	2,611	10,000	10,000
PM_{10}	24-hour	290	56	346	50	150
	Annual	65.3	23.5	88.8	20	—
$PM_{2.5}$	24-hour [e]	64.1	28.8	92.9	—	35
	Annual	12.1	9.5	21.6	12	12

[a] Background concentrations were the highest concentrations monitored during 2009 through 2011 with the exception of the 3-hour SO_2 averaging period, which was taken as the highest concentrations monitored during 2008 through 2010.
[b] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[c] Total predicted concentration for the Federal 1-hour NO_2 standard is the maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.
[d] Total predicted concentration for the Federal 1-hour SO_2 standard is the maximum modeled concentration combined with the three-year average of 99th percentile background concentrations.
[e] Total predicted concentration for the Federal 24-hour $PM_{2.5}$ standard is the maximum modeled concentration combined with the three-year average of 98th percentile background concentration.

References

U.S. Environmental Protection Agency (EPA). 2005. Guideline on Air Quality Models, 40 Code of Federal Regulations (CFR), Part 51, Appendix W. November.

U.S. Environmental Protection Agency (EPA). 2011. Additional Clarification Regarding Application of Appendix W Modeling Guidance for the I-hour NO_2, National Ambient Air Quality Standard. March.

U.S. Environmental Protection Agency (EPA). 2012. Haul Road Workgroup Final Report Submission to EPA-OAQPS. March.

DATA REQUEST

105. Please justify the use of an ambient NO_2 ratio of 0.8 or update all 1-hour NO_2 modeling by using an ambient NO_2 ratio of 0.9.

Response: In assessing compliance with the Federal 1-hour and annual NO_2 standards, the EPA allows a tiered approach to characterize the conversion of emitted NO_x (consisting of both nitrogen monoxide [NO] and NO_2) to downwind concentrations of NO_2 per the *Guideline on Air Quality Models* (40 CFR 51 Appendix W; EPA, 2005). The 3-tiered approach is summarized below:

- Tier 1: Assume 100 percent conversion of NO_x to NO_2
- Tier 2: The use of an ambient ratio method (ARM) assuming a default conversion of NO_x to NO_2 of 80 percent for 1-hour concentrations and 75 percent for annual concentrations
- Tier 3: The use of an alternate detailed analysis on a case-by-case basis

The use of the Ozone Limiting Method (OLM) and the PVMRM to characterize the conversion of hourly emitted NO_x to NO_2 may be approved as a detailed analysis on a case-by-case basis within AERMOD. EPA guidance documents (EPA, 2010; EPA, 2011) reference these two methods as appropriate with justification of model inputs and approval by the lead agency.

PVMRM was proposed for HBEP to predict the 1-hour concentrations of NO_2 if a Tier 3-level analysis was required to demonstrate compliance with the NAAQS. The inputs for the 1-hour NO_2 PVMRM modeling with AERMOD for HBEP are summarized below:

- 5-years of hourly meteorological data collected by the SCAQMD at the Costa Mesa monitoring station
- Corresponding 5-years of hourly ozone data provided by the SCAQMD for use with the Costa Mesa meteorological dataset
- In-stack NO_2/NO_x ratio of 0.5 for all HBEP sources
- PVMRM ambient ratio for NO_2/NO_x ratio of 0.8

EPA guidance (EPA, 2011) indicates that the use of 5-years of representative meteorological data with corresponding hourly ozone data is appropriate for PVMRM. The guidance document also clearly indicates that the use of a 0.5 in-stack ratio is adequate without further justification. However, the ambient ratio for 1-hour NO_2 modeling using PVMRM is not clearly defined in Appendix W, the 2010, or the 2011 guidance documents.

The PVMRM equation (Hanrahan, 1999) limits the NO_x to NO_2 conversion only if there is less ozone available within the plume volume than emitted NO_x. If there is enough ozone available to convert all NO_x to NO_2, then the PVMRM ambient ratio is utilized. Hanrahan recommends an ambient ratio of 0.9 to limit this conversion on an hourly basis if there is enough ozone to potentially convert all NO_x to NO_2. Note that this value was recommended for PVMRM prior to the development of the 1-hour NO_2 NAAQS.

EPA references the Hanrahan-recommended value of 0.9 and considered this value for the Tier 2 ARM method to characterize appropriate conversion of NO_x to NO_2. However, "[EPA did] not consider [a value of 0.9] to be an appropriate choice since it is the maximum ratio applied on a source-by-source basis, irrespective of the predicted hourly NO_x concentration, whereas the Tier 2 ARM of 0.8 would be applied to the maximum cumulative hourly NO_x concentration" (EPA, 2011). The EPA guidance also further justifies the use of a 0.8 ambient ratio for Tier 2 ARM by citing other references which characterize hourly ambient NO_2/NO_x concentrations (EPA, 2011).

As mentioned above, the PVMRM equation would limit the conversion to the model input ambient ratio only if there would be enough ozone within the plume volume to allow for the potential of complete conversion of NO_x to NO_2 (Hanrahan, 1999). If the 0.8 ambient ratio is utilized by PVMRM in AERMOD, this would, in essence, limit each source's impact by ozone limiting or the default Tier 2 ARM of 0.8 at each receptor for each hour of the day. At each receptor, the sum of each source's impacts (ozone limited or 0.8 proposed PVMRM ambient ratio predicted NO_2 concentration for each source) would be used as the cumulative impact for each hour. Therefore, the use of the default Tier 2 ARM of 0.8 would be appropriate for the PVMRM ambient ratio to characterize the conversion of NO_x to NO_2.

Regardless of the above discussion, the air dispersion modeling analysis did not employ the use of Tier 3 OLM or PVMRM options, as noted in the response to Data Request 104. Therefore, as the 0.8 ambient NO_2 ratio is considered the default value by the EPA for using the Tier 2 ARM (EPA, 2011), justifying the use of the ambient NO_2 ratio for PVMRM is not required.

References

U.S. Environmental Protection Agency (EPA). 2005. Guideline on Air Quality Models, 40 CFR, Part 51, Appendix W. November.

U.S. Environmental Protection Agency (EPA). 2010. EPA Guidance Concerning the Implementation of the 1-Hour NO_2 NAAQS for the PSD Program. June.

U.S. Environmental Protection Agency (EPA). 2011. Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2, National Ambient Air Quality Standard. March.

Hanrahan, Patrick L. 1999. The Plume Volume Molar Ratio Method for Determining NO2/NOx Ratios in Modeling—Part I: Methodology. *Journal of the Air & Waste Management Association* 49:11, 1324–1331.

DATA REQUEST

106. Please ensure the newest AERMOD Version (Version 12345) is used consistently for all the above modeling and set the wind speed option as appropriate ("Vector" or "Scalar") to match the nature of the 5-year meteorological dataset.

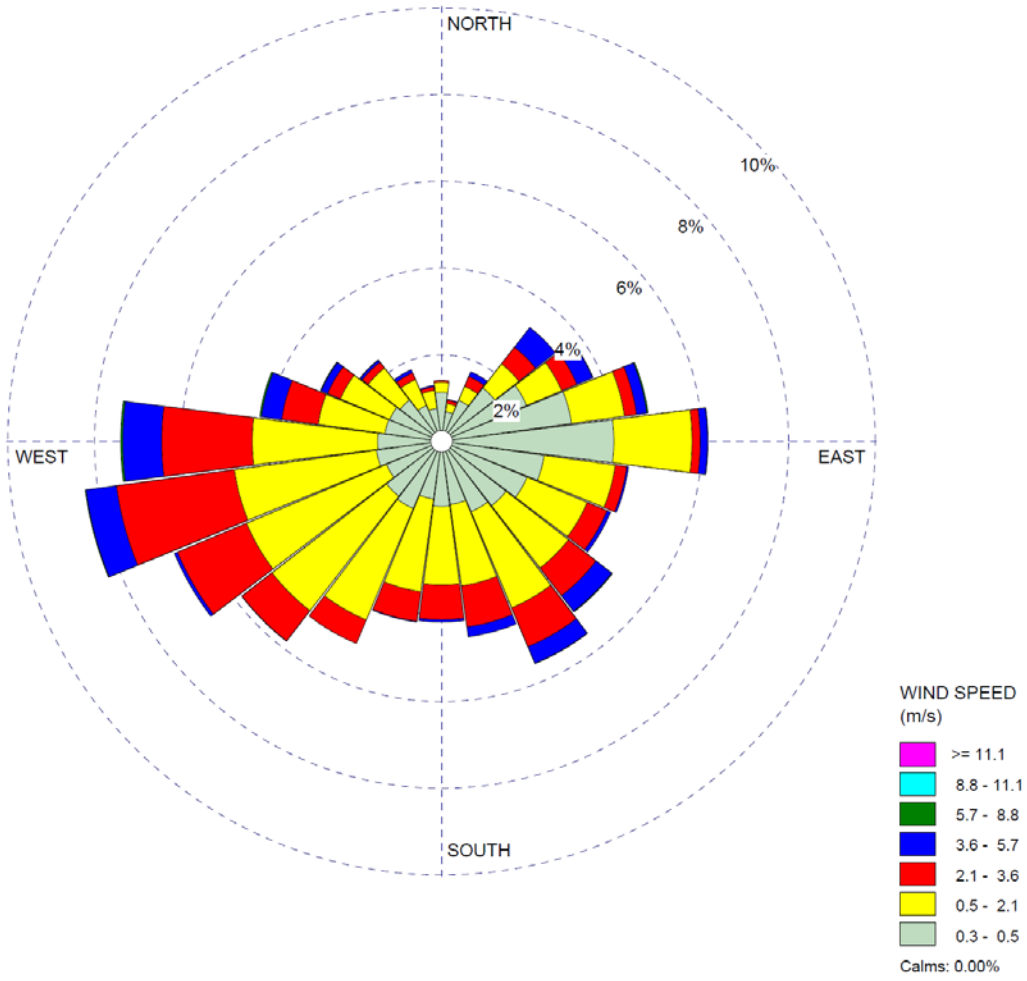
Response: As noted in the response to Data Request 104 above, all of the revised air dispersion modeling results presented above were prepared using the 5-year meteorological dataset processed by the SCAQMD and AERMOD Version 12345. As the meteorological dataset was developed with scalar mean winds per EPA guidance, the VECTORWS option in AERMOD was not selected.

Attachment DR104-1
Wind Roses and Wind Tables

Huntington Beach Energy Project
Attachment DR104-1 Figure 1
First Quarter Wind Rose
Date Range: January 1 – March 31 (2005 – 2009)

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Meteorological Station

DISPLAY:
Wind Speed
Direction (blowing from)

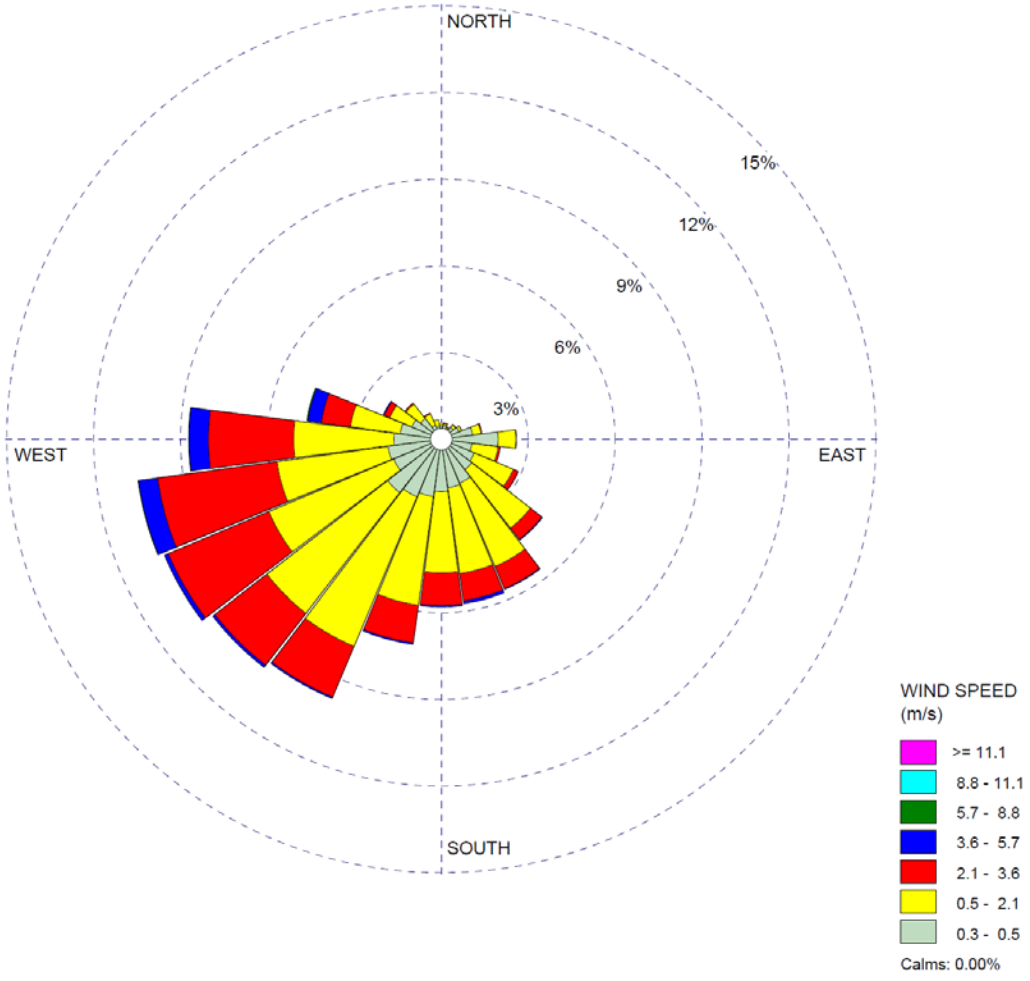


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 1/1/2005 - 03:00 **End Date: 3/31/2009 - 23:00**	MODELER:	
	CALM WINDS: **0.00%**	TOTAL COUNT: **10070 hrs.**	
	AVG. WIND SPEED: **1.28 m/s**	DATE: **5/14/2013**	PROJECT NO.:

Huntington Beach Energy Project
Attachment DR104-1 Figure 2
Second Quarter Wind Rose
Date Range: April 1 – June 30 (2005 – 2009)

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Meteorological Station

DISPLAY:
Wind Speed
Direction (blowing from)

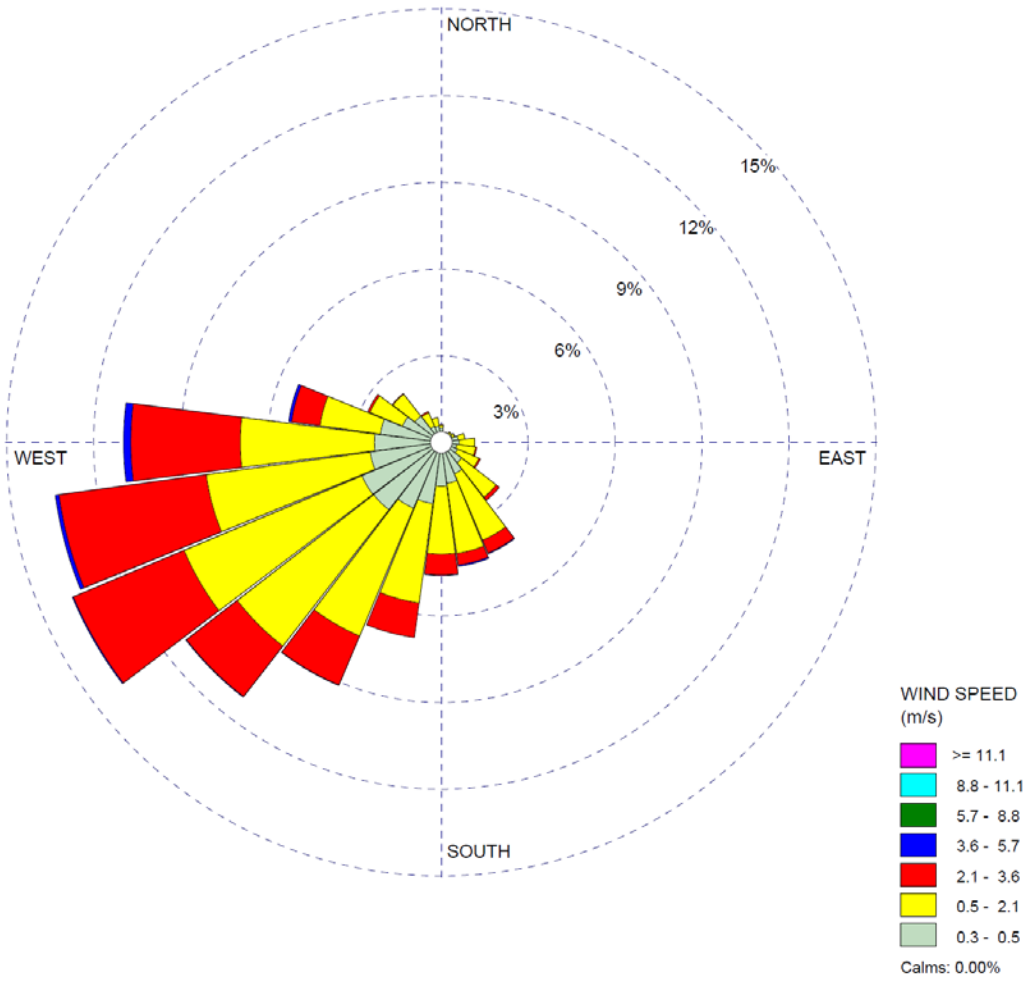


COMMENTS:	DATA PERIOD: **Start Date: 4/1/2005 - 01:00** **End Date: 6/30/2009 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.00%**	TOTAL COUNT: **10654 hrs.**	
	AVG. WIND SPEED: **1.35 m/s**	DATE: **5/14/2013**	PROJECT NO.:

Huntington Beach Energy Project
Attachment DR104-1 Figure 3
Third Quarter Wind Rose
Date Range: July 1 – September 30 (2005 – 2009)

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Meteorological Station

DISPLAY:
Wind Speed
Direction (blowing from)

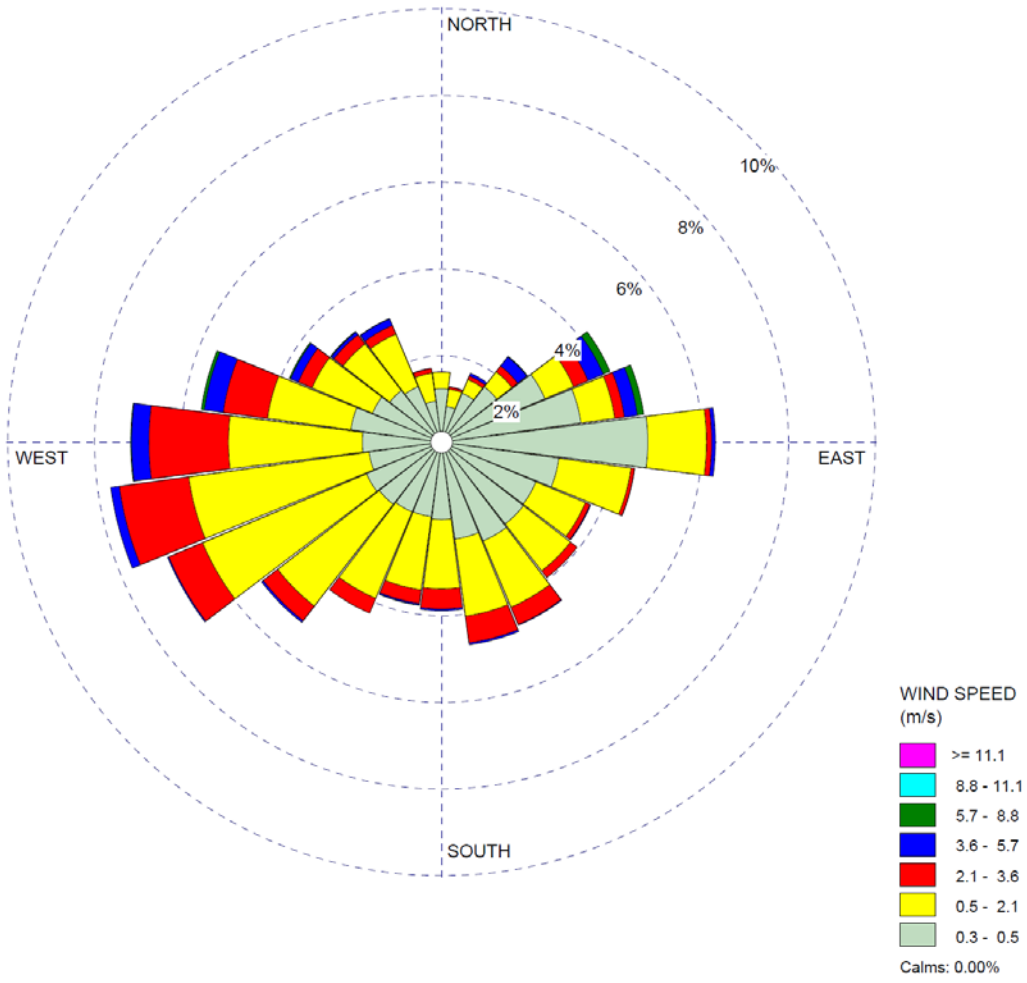


COMMENTS:	DATA PERIOD: **Start Date: 7/1/2005 - 00:00** **End Date: 9/30/2009 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.00%**	TOTAL COUNT: **10732 hrs.**	
	AVG. WIND SPEED: **1.27 m/s**	DATE: **5/14/2013**	PROJECT NO.:

Huntington Beach Energy Project
Attachment DR104-1 Figure 4
Fourth Quarter Wind Rose
Date Range: October 1 – December 31 (2005 – 2009)

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Meteorological Station

DISPLAY:
Wind Speed
Direction (blowing from)

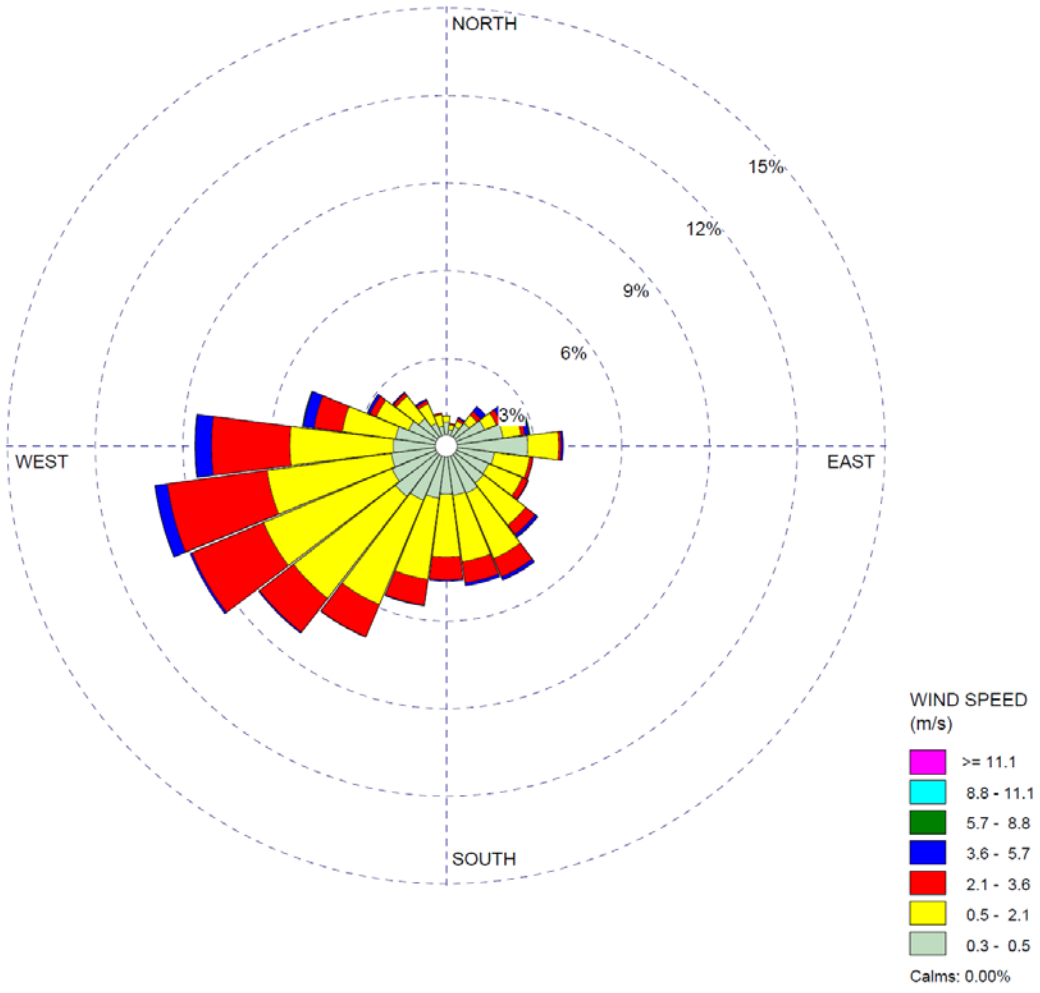


COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	Start Date: 10/1/2005 - 00:00 **End Date: 12/31/2009 - 23:00**	MODELER:	
	CALM WINDS: **0.00%**	TOTAL COUNT: **10226 hrs.**	
	AVG. WIND SPEED: **1.05 m/s**	DATE: **5/14/2013**	PROJECT NO.:

Huntington Beach Energy Project
Attachment DR104-1 Figure 5
Annual Wind Rose (2005 – 2009)

WIND ROSE PLOT:
SCAQMD Meteorological Data
Costa Mesa Meteorological Station

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS:	DATA PERIOD: **Start Date: 1/1/2005 - 03:00** **End Date: 12/31/2009 - 23:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **0.00%**	TOTAL COUNT: **41682 hrs.**	
	AVG. WIND SPEED: **1.24 m/s**	DATE: **5/14/2013**	PROJECT NO.:

Huntington Beach Energy Project
Attachment DR104-1 Table 1
First Quarter Wind Table
May 2013

Frequency Distribution (Hours)
Date Range: January 1 - March 31 (2005 - 2009)

Wind Speed (m/s) Wind Direction (from)	0.3 - 0.5	0.5 - 2.1	2.1 - 3.6	3.6 - 5.7	5.7 - 8.8	8.8 - 11.1	≥ 11.1	Total
N	142	31	7	1	0	0	0	181
NNE	129	40	26	10	0	0	0	205
NE	241	102	68	68	0	0	0	479
ENE	355	161	52	52	4	0	0	624
E	570	261	28	25	1	0	0	885
ESE	330	217	55	5	0	0	0	607
SE	293	295	114	67	2	0	0	771
SSE	251	324	149	45	1	0	0	770
S	217	285	123	12	0	0	0	637
SSW	228	345	92	1	0	0	0	666
SW	240	534	145	2	0	0	0	921
WSW	224	504	336	53	0	0	0	1,117
W	217	425	307	137	9	0	0	1,095
WNW	193	205	88	39	4	0	0	529
NW	179	132	29	13	1	0	0	354
NNW	122	83	18	6	0	0	0	229
Total	3,931	3,944	1,637	536	22	0	0	10,070

Frequency of Calm Winds: 0
Frequency of Missing Winds: 754

Huntington Beach Energy Project
Attachment DR104-1 Table 2
Second Quarter Wind Table
May 2013

Frequency Distribution (Hours)
Date Range: April 1 - June 30 (2005 - 2009)

Wind Speed (m/s) Wind Direction (from)	0.3 - 0.5	0.5 - 2.1	2.1 - 3.6	3.6 - 5.7	5.7 - 8.8	8.8 - 11.1	≥ 11.1	Total
N	91	16	0	0	0	0	0	107
NNE	59	6	4	0	0	0	0	69
NE	89	17	3	1	0	0	0	110
ENE	130	31	4	0	0	0	0	165
E	280	100	5	0	0	0	0	385
ESE	173	172	15	0	0	0	0	360
SE	228	426	79	4	0	0	0	737
SSE	258	474	147	12	0	0	0	891
S	296	478	183	12	0	0	0	969
SSW	322	745	249	8	0	0	0	1,324
SW	372	867	377	12	0	0	0	1,628
WSW	279	644	648	66	1	0	0	1,638
W	258	534	465	111	3	0	0	1,371
WNW	203	195	86	33	4	0	0	521
NW	148	101	9	1	0	0	0	259
NNW	64	53	3	0	0	0	0	120
Total	3,250	4,859	2,277	260	8	0	0	10,654

Frequency of Calm Winds: 0
Frequency of Missing Winds: 266

Huntington Beach Energy Project
Attachment DR104-1 Table 3
Third Quarter Wind Table
May 2013

Frequency Distribution (Hours)
Date Range: July 1 - September 30 (2005 - 2009)

Wind Speed (m/s) Wind Direction (from)	0.3 - 0.5	0.5 - 2.1	2.1 - 3.6	3.6 - 5.7	5.7 - 8.8	8.8 - 11.1	≥ 11.1	Total
N	75	20	1	0	0	0	0	96
NNE	45	15	0	0	0	0	0	60
NE	60	16	1	0	0	0	0	77
ENE	73	23	0	3	0	0	0	99
E	102	87	2	0	0	0	0	191
ESE	83	117	8	0	0	0	0	208
SE	146	250	25	0	0	0	0	421
SSE	199	398	75	6	0	0	0	678
S	268	405	127	4	0	0	0	804
SSW	375	638	242	2	0	0	0	1,257
SW	478	977	370	3	0	0	0	1,828
WSW	424	985	762	11	0	0	0	2,182
W	372	730	606	38	0	0	0	1,746
WNW	282	258	56	7	0	0	0	603
NW	182	143	7	0	0	0	0	332
NNW	87	59	4	0	0	0	0	150
Total	3,251	5,121	2,286	74	0	0	0	10,732

Frequency of Calm Winds: 0
Frequency of Missing Winds: 308

Huntington Beach Energy Project
Attachment DR104-1 Table 4
Fourth Quarter Wind Table
May 2013

Frequency Distribution (Hours)
Date Range: October 1 - December 31 (2005 - 2009)

Wind Speed (m/s) Wind Direction (from)	0.3 - 0.5	0.5 - 2.1	2.1 - 3.6	3.6 - 5.7	5.7 - 8.8	8.8 - 11.1	≥ 11.1	Total
N	174	61	2	0	0	0	0	237
NNE	150	61	10	3	0	0	0	224
NE	246	70	33	41	7	0	0	397
ENE	458	115	41	55	25	0	0	694
E	672	209	18	15	2	0	0	916
ESE	366	217	14	3	0	0	0	600
SE	375	213	40	0	0	0	0	628
SSE	340	240	80	7	0	0	0	667
S	295	277	74	4	0	0	0	650
SSW	265	283	44	3	1	0	0	596
SW	275	449	72	5	0	0	0	801
WSW	269	650	182	14	0	0	0	1,115
W	303	498	274	67	2	0	0	1,144
WNW	285	254	98	41	10	0	0	688
NW	241	204	36	18	2	0	0	501
NNW	169	153	30	15	1	0	0	368
Total	4,883	3,954	1,048	291	50	0	0	10,226

Frequency of Calm Winds: 0
Frequency of Missing Winds: 814

Attachment DR104-2
Supporting Documentation for Construction, Commissioning, and Operational Impacts Analysis

Huntington Beach Energy Project
Attachment DR104-2 Table 1
Construction Source Parameters for AERMOD Input
May2013

Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)	Easting (X5) (m)	Northing (Y5) (m)	Easting (X6) (m)	Northing (Y6) (m)	Easting (X7) (m)	Northing (Y7) (m)	Easting (X8) (m)	Northing (Y8) (m)	Easting (X9) (m)	Northing (Y9) (m)
FUGE	3.7	0.0	9	1.0	409452	3723309	409563	3723310	409565	3723115	409537	3723136	409449	3723089	409315	3723180	409358	3723245	409372	3723242	409453	3723187
FUGS	3.7	0.0	4	1.0	409199	3723086	409281	3723203	409449	3723089	409304	3723012										

Area Sources

Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North	Vertical Dimension (m)
FUGW	409066	3723183	3.7	0.0	165	215	35	1.0

Point Sources

Source ID	Stack Release Type (Beta)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
E(1-70)	Horizontal	3.7	4.6	533.00	18.00	0.127
W(1-72)	Horizontal	3.7	4.6	533.00	18.00	0.127
S(1-46)	Horizontal	3.7	4.6	533.00	18.00	0.127

Huntington Beach Energy Project
Attachment DR104-2 Table 2
Detailed Construction Exhaust Stack Parameters
May 2013

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
E01	Horizontal	409329	3723184	3.7	4.6	533	18	0.127
E02	Horizontal	409345	3723173	3.7	4.6	533	18	0.127
E03	Horizontal	409362	3723161	3.7	4.6	533	18	0.127
E04	Horizontal	409378	3723150	3.7	4.6	533	18	0.127
E05	Horizontal	409341	3723203	3.7	4.6	533	18	0.127
E06	Horizontal	409358	3723191	3.7	4.6	533	18	0.127
E07	Horizontal	409374	3723180	3.7	4.6	533	18	0.127
E08	Horizontal	409391	3723168	3.7	4.6	533	18	0.127
E09	Horizontal	409354	3723222	3.7	4.6	533	18	0.127
E10	Horizontal	409371	3723210	3.7	4.6	533	18	0.127
E11	Horizontal	409387	3723199	3.7	4.6	533	18	0.127
E12	Horizontal	409404	3723187	3.7	4.6	533	18	0.127
E13	Horizontal	409395	3723138	3.7	4.6	533	18	0.127
E14	Horizontal	409412	3723126	3.7	4.6	533	18	0.127
E15	Horizontal	409428	3723115	3.7	4.6	533	18	0.127
E16	Horizontal	409445	3723103	3.7	4.6	533	18	0.127
E17	Horizontal	409408	3723157	3.7	4.6	533	18	0.127
E18	Horizontal	409424	3723145	3.7	4.6	533	18	0.127
E19	Horizontal	409441	3723133	3.7	4.6	533	18	0.127
E20	Horizontal	409457	3723122	3.7	4.6	533	18	0.127
E21	Horizontal	409420	3723175	3.7	4.6	533	18	0.127
E22	Horizontal	409437	3723164	3.7	4.6	533	18	0.127
E23	Horizontal	409454	3723152	3.7	4.6	533	18	0.127
E24	Horizontal	409470	3723141	3.7	4.6	533	18	0.127
E25	Horizontal	409487	3723129	3.7	4.6	533	18	0.127
E26	Horizontal	409469	3723294	3.7	4.6	533	18	0.127
E27	Horizontal	409469	3723276	3.7	4.6	533	18	0.127
E28	Horizontal	409469	3723257	3.7	4.6	533	18	0.127
E29	Horizontal	409469	3723239	3.7	4.6	533	18	0.127
E30	Horizontal	409469	3723221	3.7	4.6	533	18	0.127
E31	Horizontal	409469	3723202	3.7	4.6	533	18	0.127
E32	Horizontal	409469	3723184	3.7	4.6	533	18	0.127
E33	Horizontal	409469	3723166	3.7	4.6	533	18	0.127
E34	Horizontal	409488	3723294	3.7	4.6	533	18	0.127
E35	Horizontal	409488	3723276	3.7	4.6	533	18	0.127
E36	Horizontal	409488	3723257	3.7	4.6	533	18	0.127
E37	Horizontal	409488	3723239	3.7	4.6	533	18	0.127
E38	Horizontal	409489	3723221	3.7	4.6	533	18	0.127
E39	Horizontal	409489	3723203	3.7	4.6	533	18	0.127
E40	Horizontal	409489	3723184	3.7	4.6	533	18	0.127
E41	Horizontal	409489	3723166	3.7	4.6	533	18	0.127
E42	Horizontal	409489	3723148	3.7	4.6	533	18	0.127
E43	Horizontal	409508	3723294	3.7	4.6	533	18	0.127
E44	Horizontal	409508	3723276	3.7	4.6	533	18	0.127
E45	Horizontal	409508	3723258	3.7	4.6	533	18	0.127
E46	Horizontal	409508	3723239	3.7	4.6	533	18	0.127
E47	Horizontal	409508	3723221	3.7	4.6	533	18	0.127
E48	Horizontal	409508	3723203	3.7	4.6	533	18	0.127
E49	Horizontal	409508	3723184	3.7	4.6	533	18	0.127
E50	Horizontal	409508	3723166	3.7	4.6	533	18	0.127
E51	Horizontal	409508	3723148	3.7	4.6	533	18	0.127
E52	Horizontal	409527	3723294	3.7	4.6	533	18	0.127
E53	Horizontal	409527	3723276	3.7	4.6	533	18	0.127
E54	Horizontal	409527	3723258	3.7	4.6	533	18	0.127
E55	Horizontal	409527	3723239	3.7	4.6	533	18	0.127
E56	Horizontal	409528	3723221	3.7	4.6	533	18	0.127
E57	Horizontal	409528	3723203	3.7	4.6	533	18	0.127
E58	Horizontal	409528	3723185	3.7	4.6	533	18	0.127
E59	Horizontal	409528	3723166	3.7	4.6	533	18	0.127
E60	Horizontal	409528	3723148	3.7	4.6	533	18	0.127
E61	Horizontal	409547	3723295	3.7	4.6	533	18	0.127
E62	Horizontal	409547	3723276	3.7	4.6	533	18	0.127
E63	Horizontal	409547	3723258	3.7	4.6	533	18	0.127
E64	Horizontal	409547	3723240	3.7	4.6	533	18	0.127
E65	Horizontal	409547	3723221	3.7	4.6	533	18	0.127
E66	Horizontal	409547	3723203	3.7	4.6	533	18	0.127

Huntington Beach Energy Project
Attachment DR104-2 Table 2
Detailed Construction Exhaust Stack Parameters
May 2013

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
E67	Horizontal	409547	3723185	3.7	4.6	533	18	0.127
E68	Horizontal	409547	3723166	3.7	4.6	533	18	0.127
E69	Horizontal	409547	3723148	3.7	4.6	533	18	0.127
E70	Horizontal	409509	3723130	3.7	4.6	533	18	0.127
W01	Horizontal	409086	3723188	3.7	4.6	533	18	0.127
W02	Horizontal	409103	3723177	3.7	4.6	533	18	0.127
W03	Horizontal	409120	3723165	3.7	4.6	533	18	0.127
W04	Horizontal	409136	3723153	3.7	4.6	533	18	0.127
W05	Horizontal	409153	3723142	3.7	4.6	533	18	0.127
W06	Horizontal	409169	3723130	3.7	4.6	533	18	0.127
W07	Horizontal	409186	3723119	3.7	4.6	533	18	0.127
W08	Horizontal	409203	3723107	3.7	4.6	533	18	0.127
W09	Horizontal	409099	3723207	3.7	4.6	533	18	0.127
W10	Horizontal	409116	3723195	3.7	4.6	533	18	0.127
W11	Horizontal	409132	3723184	3.7	4.6	533	18	0.127
W12	Horizontal	409149	3723172	3.7	4.6	533	18	0.127
W13	Horizontal	409165	3723160	3.7	4.6	533	18	0.127
W14	Horizontal	409182	3723149	3.7	4.6	533	18	0.127
W15	Horizontal	409199	3723137	3.7	4.6	533	18	0.127
W16	Horizontal	409215	3723126	3.7	4.6	533	18	0.127
W17	Horizontal	409112	3723226	3.7	4.6	533	18	0.127
W18	Horizontal	409128	3723214	3.7	4.6	533	18	0.127
W19	Horizontal	409145	3723202	3.7	4.6	533	18	0.127
W20	Horizontal	409162	3723191	3.7	4.6	533	18	0.127
W21	Horizontal	409178	3723179	3.7	4.6	533	18	0.127
W22	Horizontal	409195	3723168	3.7	4.6	533	18	0.127
W23	Horizontal	409211	3723156	3.7	4.6	533	18	0.127
W24	Horizontal	409228	3723144	3.7	4.6	533	18	0.127
W25	Horizontal	409124	3723244	3.7	4.6	533	18	0.127
W26	Horizontal	409141	3723233	3.7	4.6	533	18	0.127
W27	Horizontal	409158	3723221	3.7	4.6	533	18	0.127
W28	Horizontal	409174	3723209	3.7	4.6	533	18	0.127
W29	Horizontal	409191	3723198	3.7	4.6	533	18	0.127
W30	Horizontal	409207	3723186	3.7	4.6	533	18	0.127
W31	Horizontal	409224	3723175	3.7	4.6	533	18	0.127
W32	Horizontal	409241	3723163	3.7	4.6	533	18	0.127
W33	Horizontal	409137	3723263	3.7	4.6	533	18	0.127
W34	Horizontal	409154	3723251	3.7	4.6	533	18	0.127
W35	Horizontal	409170	3723240	3.7	4.6	533	18	0.127
W36	Horizontal	409187	3723228	3.7	4.6	533	18	0.127
W37	Horizontal	409204	3723217	3.7	4.6	533	18	0.127
W38	Horizontal	409220	3723205	3.7	4.6	533	18	0.127
W39	Horizontal	409237	3723193	3.7	4.6	533	18	0.127
W40	Horizontal	409253	3723182	3.7	4.6	533	18	0.127
W41	Horizontal	409150	3723282	3.7	4.6	533	18	0.127
W42	Horizontal	409166	3723270	3.7	4.6	533	18	0.127
W43	Horizontal	409183	3723258	3.7	4.6	533	18	0.127
W44	Horizontal	409200	3723247	3.7	4.6	533	18	0.127
W45	Horizontal	409216	3723235	3.7	4.6	533	18	0.127
W46	Horizontal	409233	3723224	3.7	4.6	533	18	0.127
W47	Horizontal	409249	3723212	3.7	4.6	533	18	0.127
W48	Horizontal	409266	3723200	3.7	4.6	533	18	0.127
W49	Horizontal	409163	3723300	3.7	4.6	533	18	0.127
W50	Horizontal	409179	3723289	3.7	4.6	533	18	0.127
W51	Horizontal	409196	3723277	3.7	4.6	533	18	0.127
W52	Horizontal	409212	3723266	3.7	4.6	533	18	0.127
W53	Horizontal	409229	3723254	3.7	4.6	533	18	0.127
W54	Horizontal	409246	3723242	3.7	4.6	533	18	0.127
W55	Horizontal	409262	3723231	3.7	4.6	533	18	0.127
W56	Horizontal	409279	3723219	3.7	4.6	533	18	0.127
W57	Horizontal	409175	3723319	3.7	4.6	533	18	0.127
W58	Horizontal	409192	3723307	3.7	4.6	533	18	0.127
W59	Horizontal	409208	3723296	3.7	4.6	533	18	0.127
W60	Horizontal	409225	3723284	3.7	4.6	533	18	0.127
W61	Horizontal	409242	3723273	3.7	4.6	533	18	0.127
W62	Horizontal	409258	3723261	3.7	4.6	533	18	0.127

Huntington Beach Energy Project
Attachment DR104-2 Table 2
Detailed Construction Exhaust Stack Parameters
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Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
W63	Horizontal	409275	3723249	3.7	4.6	533	18	0.127
W64	Horizontal	409291	3723238	3.7	4.6	533	18	0.127
W65	Horizontal	409188	3723338	3.7	4.6	533	18	0.127
W66	Horizontal	409205	3723326	3.7	4.6	533	18	0.127
W67	Horizontal	409221	3723315	3.7	4.6	533	18	0.127
W68	Horizontal	409238	3723303	3.7	4.6	533	18	0.127
W69	Horizontal	409254	3723291	3.7	4.6	533	18	0.127
W70	Horizontal	409271	3723280	3.7	4.6	533	18	0.127
W71	Horizontal	409288	3723268	3.7	4.6	533	18	0.127
W72	Horizontal	409304	3723257	3.7	4.6	533	18	0.127
S01	Horizontal	409219	3723095	3.7	4.6	533	18	0.127
S02	Horizontal	409236	3723084	3.7	4.6	533	18	0.127
S03	Horizontal	409252	3723072	3.7	4.6	533	18	0.127
S04	Horizontal	409269	3723061	3.7	4.6	533	18	0.127
S05	Horizontal	409286	3723049	3.7	4.6	533	18	0.127
S06	Horizontal	409302	3723037	3.7	4.6	533	18	0.127
S07	Horizontal	409232	3723114	3.7	4.6	533	18	0.127
S08	Horizontal	409248	3723102	3.7	4.6	533	18	0.127
S09	Horizontal	409265	3723091	3.7	4.6	533	18	0.127
S10	Horizontal	409282	3723079	3.7	4.6	533	18	0.127
S11	Horizontal	409298	3723068	3.7	4.6	533	18	0.127
S12	Horizontal	409315	3723056	3.7	4.6	533	18	0.127
S13	Horizontal	409245	3723133	3.7	4.6	533	18	0.127
S14	Horizontal	409261	3723121	3.7	4.6	533	18	0.127
S15	Horizontal	409278	3723110	3.7	4.6	533	18	0.127
S16	Horizontal	409294	3723098	3.7	4.6	533	18	0.127
S17	Horizontal	409311	3723086	3.7	4.6	533	18	0.127
S18	Horizontal	409328	3723075	3.7	4.6	533	18	0.127
S19	Horizontal	409257	3723151	3.7	4.6	533	18	0.127
S20	Horizontal	409274	3723140	3.7	4.6	533	18	0.127
S21	Horizontal	409290	3723128	3.7	4.6	533	18	0.127
S22	Horizontal	409307	3723117	3.7	4.6	533	18	0.127
S23	Horizontal	409324	3723105	3.7	4.6	533	18	0.127
S24	Horizontal	409340	3723093	3.7	4.6	533	18	0.127
S25	Horizontal	409270	3723170	3.7	4.6	533	18	0.127
S26	Horizontal	409287	3723159	3.7	4.6	533	18	0.127
S27	Horizontal	409303	3723147	3.7	4.6	533	18	0.127
S28	Horizontal	409320	3723135	3.7	4.6	533	18	0.127
S29	Horizontal	409336	3723124	3.7	4.6	533	18	0.127
S30	Horizontal	409353	3723112	3.7	4.6	533	18	0.127
S31	Horizontal	409283	3723189	3.7	4.6	533	18	0.127
S32	Horizontal	409299	3723177	3.7	4.6	533	18	0.127
S33	Horizontal	409316	3723166	3.7	4.6	533	18	0.127
S34	Horizontal	409332	3723154	3.7	4.6	533	18	0.127
S35	Horizontal	409349	3723142	3.7	4.6	533	18	0.127
S36	Horizontal	409366	3723131	3.7	4.6	533	18	0.127
S37	Horizontal	409331	3723044	3.7	4.6	533	18	0.127
S38	Horizontal	409344	3723063	3.7	4.6	533	18	0.127
S39	Horizontal	409357	3723082	3.7	4.6	533	18	0.127
S40	Horizontal	409373	3723070	3.7	4.6	533	18	0.127
S41	Horizontal	409370	3723101	3.7	4.6	533	18	0.127
S42	Horizontal	409386	3723089	3.7	4.6	533	18	0.127
S43	Horizontal	409403	3723077	3.7	4.6	533	18	0.127
S44	Horizontal	409382	3723119	3.7	4.6	533	18	0.127
S45	Horizontal	409399	3723108	3.7	4.6	533	18	0.127
S46	Horizontal	409415	3723096	3.7	4.6	533	18	0.127

Huntington Beach Energy Project
Attachment DR104-2 Table 3
Construction Modeling Parameters - Emission Rates
May 2013

Emission Rates for 1-hr, 3-hr, 8-hr, and 24-hr Modeling [a]

Source ID	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
	(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)
FUGE	-	-	-	-	-	-	-	-	-	-	-	-	0.039	0.31	0.004	0.031
FUGW	-	-	-	-	-	-	-	-	-	-	-	-	0.34	2.70	0.074	0.59
FUGS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E(1-70)	0.24	1.90	0.17	1.33	0.168	1.33	4.9E-04	3.9E-03	4.9E-04	3.9E-03	2.1E-04	1.6E-03	0.0045	0.035	0.0044	0.035
W(1-72)	0.70	5.52	0.70	5.57	0.702	5.57	1.3E-03	1.0E-02	1.3E-03	1.0E-02	5.4E-04	4.2E-03	0.018	0.14	0.018	0.14
S(1-46)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maximum Month	37		37		37		37		37		37		37		37	

Emission Rates for Annual Modeling [a]

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
FUGE	-	-	-	-	0.020	0.16
FUGW	-	-	-	-	-	-
FUGS	-	-	0.15	1.19	-	-
E(1-70)	0.24	1.88	-	-	0.014	0.11
W(1-72)	-	-	-	-	-	-
S(1-46)	-	-	0.0073	0.058	-	-
Maximum Months	8-19		77-88		9-20	

[a] Emission rates for exhaust point sources (E, W, and S source groups) are presented as the sum total for all sources in the respective group.

Huntington Beach Energy Project
Attachment DR104-2 Table 4
Construction Modeling Results
May 2013

Source	Year	NO_2 ($\mu g/m^3$)			CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
		1-hr [a]	Federal 1-hr [b]	Annual [a]	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
ALL	2005	73.0	158	6.67	89.0	67.7	0.17	0.15	0.037	254	34.7	56.0	12.2
FUG		-	-	-	-	-	-	-	-	253	34.4	55.2	11.6
EXH		73.0	73.0	6.67	89.0	67.7	0.17	0.15	0.037	1.22	0.23	1.22	0.53
EAST		21.7	21.7	6.67	19.0	13.9	0.06	0.05	0.014	33.0	-	3.45	12.2
WEST		66.4	66.4	-	83.8	64.1	0.15	0.14	0.035	253	-	55.9	-
SOUTH		-	-	-	-	-	-	-	-	-	34.7	-	-
ALL	2006	71.5	165	6.58	88.4	65.4	0.17	0.15	0.036	246	34.5	53.4	12.3
FUG		-	-	-	-	-	-	-	-	245	34.3	52.8	11.8
EXH		71.5	71.5	6.58	88.4	65.4	0.17	0.15	0.036	1.19	0.23	1.18	0.52
EAST		21.9	21.9	6.58	19.2	14.9	0.06	0.05	0.012	33.4	-	3.49	12.3
WEST		66.7	66.7	-	84.1	63.2	0.15	0.15	0.035	239	-	52.7	
SOUTH		-	-	-	-	-	-	-	-	-	34.5	-	
ALL	2007	70.2	163	6.11	86.6	78.3	0.16	0.16	0.042	226	35.7	49.4	11.1
FUG		-	-	-	-	-	-	-	-	225	35.5	48.7	10.7
EXH		70.2	70.2	6.11	86.6	78.3	0.16	0.16	0.042	1.33	0.23	1.33	0.48
EAST		22.3	22.3	6.11	19.6	15.5	0.06	0.05	0.012	32.0	-	3.36	11.1
WEST		65.9	65.9	-	83.1	71.5	0.15	0.14	0.036	221	-	48.8	
SOUTH		-	-	-	-	-	-	-	-	-	35.7	-	
ALL	2008	71.4	162	6.16	87.3	64.1	0.17	0.15	0.035	179	36.7	39.9	10.0
FUG		-	-	-	-	-	-	-	-	178	36.5	39.0	9.6
EXH		71.4	71.4	6.16	87.3	64.1	0.17	0.15	0.035	1.14	0.23	1.14	0.49
EAST		22.2	22.2	6.16	19.5	14.1	0.06	0.05	0.012	27.2	-	2.85	10.0
WEST		66.2	66.2	-	83.6	59.4	0.15	0.14	0.033	179	-	39.8	
SOUTH		-	-	-	-	-	-	-	-	-	36.7	-	
ALL	2009	73.4	166	6.35	89.6	62.8	0.17	0.16	0.037	202	43.7	44.8	10.8
FUG		-	-	-	-	-	-	-	-	201	43.4	44.0	10.3
EXH		73.4	73.4	6.35	89.6	62.8	0.17	0.16	0.037	1.20	0.24	1.20	0.50
EAST		22.0	22.0	6.35	19.3	13.0	0.06	0.05	0.013	30.0	-	3.14	10.8
WEST		66.3	66.3	-	83.6	58.8	0.15	0.13	0.035	202	-	44.7	
SOUTH		-	-	-	-	-	-	-	-	-	43.7	-	

[a] The maximum 1-hour and annual NO_2 concentrations include ambient NO_2 ratios of 0.80 (EPA, 2011) and 0.75 (EPA, 2005), respectively.
[b] Total predicted concentration for the Federal 1-hour NO_2 standard (source ALL) is the maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.

Huntington Beach Energy Project
Attachment DR104-2 Table 5
Commissioning Source Parameters for AERMOD Input
May 2013

Point Sources

Scenario	Building Name	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_2 (g/s)	NO_2 (lb/hr)	CO (g/s)	CO (lb/hr)
5% Load	Stack 1	409185	3723252	3.7	36.6	500	10.1	5.49	6.11	48.5	215.4	1709
	Stack 2	409216	3723231	3.7	36.6	500	10.1	5.49	6.11	48.5	215.4	1709
	Stack 3	409245	3723210	3.7	36.6	500	10.1	5.49	6.11	48.5	215.4	1709
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
40% Load	Stack 1	409185	3723252	3.7	36.6	473	9.9	5.49	3.27	26.0	172.9	1373
	Stack 2	409216	3723231	3.7	36.6	473	9.9	5.49	3.27	26.0	172.9	1373
	Stack 3	409245	3723210	3.7	36.6	473	9.9	5.49	3.27	26.0	172.9	1373
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
50% Load	Stack 1	409185	3723252	3.7	36.6	466	9.9	5.49	13.82	109.7	399.3	3169
	Stack 2	409216	3723231	3.7	36.6	466	9.9	5.49	13.82	109.7	399.3	3169
	Stack 3	409245	3723210	3.7	36.6	466	9.9	5.49	13.82	109.7	399.3	3169
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
100% Load	Stack 1	409185	3723252	3.7	36.6	472	22.7	5.49	5.29	42.0	3.57	28.4
	Stack 2	409216	3723231	3.7	36.6	472	22.7	5.49	5.29	42.0	3.57	28.4
	Stack 3	409245	3723210	3.7	36.6	472	22.7	5.49	5.29	42.0	3.57	28.4
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49	3.21	25.5	14.53	115.3

Huntington Beach Energy Project
Attachment DR104-2 Table 6
Commissioning Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)
Admin	2	1	3.66	3.35	16	409290	3723286	409355	3723240	409351	3723235	409348	3723237
Admin	*	2	*	5.18	14	409287	3723281	409348	3723237	409338	3723223	409343	3723219
STG2	1	1	3.66	12.19	4	409165	3723276	409180	3723266	409170	3723252	409156	3723262
ACC2	1	1	3.66	31.70	4	409212	3723305	409263	3723269	409241	3723237	409189	3723274
ACC1	1	1	3.66	31.70	4	409474	3723311	409536	3723311	409537	3723274	409474	3723274
STG1	1	1	3.66	12.19	4	409538	3723247	409556	3723247	409556	3723231	409538	3723231
CTG4	1	1	3.66	28.04	4	409500	3723162	409517	3723162	409517	3723149	409500	3723150
CTG5	1	1	3.66	28.04	4	409500	3723198	409517	3723198	409517	3723186	409500	3723186
CTG6	1	1	3.66	28.04	4	409499	3723236	409517	3723236	409517	3723223	409499	3723224
CTG1	1	1	3.66	28.04	4	409166	3723235	409176	3723252	409188	3723244	409178	3723228
CTG2	1	1	3.66	28.04	4	409197	3723216	409207	3723232	409219	3723224	409209	3723208
CTG3	1	1	3.66	28.04	4	409226	3723194	409236	3723210	409247	3723203	409237	3723187
AIRIN6	1	1	3.66	11.61	6	409470	3723211	409470	3723215	409475	3723225	409477	3723225
AIRIN5	1	1	3.66	11.61	6	409471	3723174	409471	3723178	409476	3723188	409478	3723188
AIRIN4	1	1	3.66	11.61	6	409471	3723136	409471	3723141	409476	3723151	409478	3723151
AIRIN1	1	1	3.66	11.61	6	409172	3723196	409169	3723199	409163	3723209	409164	3723211
AIRIN2	1	1	3.66	11.61	6	409202	3723175	409199	3723178	409194	3723188	409195	3723190
AIRIN3	1	1	3.66	11.61	6	409232	3723154	409229	3723157	409224	3723167	409225	3723169
B1	2	1	3.66	23.16	4	409293	3723102	409312	3723128	409335	3723112	409317	3723086
B1	*	2	*	37.64	4	409301	3723114	409312	3723128	409335	3723112	409326	3723098
B2	2	1	3.66	23.16	4	409252	3723127	409272	3723153	409295	3723137	409277	3723111
B2	*	2	*	37.64	4	409261	3723139	409272	3723153	409295	3723137	409285	3723123

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	60.96	6.27

Huntington Beach Energy Project
Attachment DR104-2 Table 6
Commissioning Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)	Corner 10 East (X) (m)	Corner 10 North (Y) (m)
Admin	2	1	3.66	3.35	16	409338	3723223	409343	3723219	409333	3723205	409321	3723213	409323	3723216	409296	3723237
Admin	*	2	*	5.18	14	409333	3723205	409321	3723213	409323	3723216	409296	3723237	409296	3723237	409292	3723241
STG2	1	1	3.66	12.19	4												
ACC2	1	1	3.66	31.70	4												
ACC1	1	1	3.66	31.70	4												
STG1	1	1	3.66	12.19	4												
CTG4	1	1	3.66	28.04	4												
CTG5	1	1	3.66	28.04	4												
CTG6	1	1	3.66	28.04	4												
CTG1	1	1	3.66	28.04	4												
CTG2	1	1	3.66	28.04	4												
CTG3	1	1	3.66	28.04	4												
AIRIN6	1	1	3.66	11.61	6	409482	3723215	409482	3723210								
AIRIN5	1	1	3.66	11.61	6	409483	3723178	409483	3723174								
AIRIN4	1	1	3.66	11.61	6	409483	3723140	409483	3723136								
AIRIN1	1	1	3.66	11.61	6	409176	3723208	409179	3723206								
AIRIN2	1	1	3.66	11.61	6	409206	3723187	409209	3723185								
AIRIN3	1	1	3.66	11.61	6	409236	3723166	409239	3723164								
B1	2	1	3.66	23.16	4												
B1	*	2	*	37.64	4												
B2	2	1	3.66	23.16	4												
B2	*	2	*	37.64	4												

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	60.96	6.27

Huntington Beach Energy Project
Attachment DR104-2 Table 6
Commissioning Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 11 East (X) (m)	Corner 11 North (Y) (m)	Corner 12 East (X) (m)	Corner 12 North (Y) (m)	Corner 13 East (X) (m)	Corner 13 North (Y) (m)	Corner 14 East (X) (m)	Corner 14 North (Y) (m)	Corner 15 East (X) (m)	Corner 15 North (Y) (m)	Corner 16 East (X) (m)	Corner 16 North (Y) (m)
Admin	2	1	3.66	3.35	16	409296	3723237	409292	3723241	409293	3723243	409279	3723252	409292	3723270	409283	3723276
Admin	*	2	*	5.18	14	409293	3723243	409279	3723252	409292	3723270	409283	3723276				
STG2	1	1	3.66	12.19	4												
ACC2	1	1	3.66	31.70	4												
ACC1	1	1	3.66	31.70	4												
STG1	1	1	3.66	12.19	4												
CTG4	1	1	3.66	28.04	4												
CTG5	1	1	3.66	28.04	4												
CTG6	1	1	3.66	28.04	4												
CTG1	1	1	3.66	28.04	4												
CTG2	1	1	3.66	28.04	4												
CTG3	1	1	3.66	28.04	4												
AIRIN6	1	1	3.66	11.61	6												
AIRIN5	1	1	3.66	11.61	6												
AIRIN4	1	1	3.66	11.61	6												
AIRIN1	1	1	3.66	11.61	6												
AIRIN2	1	1	3.66	11.61	6												
AIRIN3	1	1	3.66	11.61	6												
B1	2	1	3.66	23.16	4												
B1	*	2	*	37.64	4												
B2	2	1	3.66	23.16	4												
B2	*	2	*	37.64	4												

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	60.96	6.27

Huntington Beach Energy Project
Attachment DR104-2 Table 7
Commissioning Modeling Results Summary
May 2013

Scenario	Year	NO_2 ($\mu g/m^3$)	CO ($\mu g/m^3$)	
		1-hr [a]	1-hr	8-hr
5% Load	2005	48.2	2,123	822
	2006	69.8	3,072	1,557
	2007	82.5	3,632	1,123
	2008	69.1	3,043	1,233
	2009	80.4	3,538	980
40% Load	2005	30.1	1,987	790
	2006	41.3	2,731	1,413
	2007	47.8	3,156	1,074
	2008	41.2	2,720	1,092
	2009	46.7	3,082	882
50% Load	2005	131	4,727	1,912
	2006	177	6,389	3,391
	2007	204	7,376	2,556
	2008	179	6,459	2,592
	2009	202	7,302	2,110
100% Load	2005	27.3	74.6	39.2
	2006	20.7	59.2	38.8
	2007	24.8	56.4	38.9
	2008	22.7	53.5	35.0
	2009	29.7	83.2	38.5

[a] The maximum 1-hour NO_2 concentrations include an ambient NO_2 ratio of 0.80.

Huntington Beach Energy Project
Attachment DR104-2 Table 8
Operational Modeling Parameters - Stack Parameters
May 2013

Point Sources

Scenario	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
1	Stack 1	409185	3723252	3.7	36.6	457	24.1	5.49
	Stack 2	409216	3723231	3.7	36.6	457	24.1	5.49
	Stack 3	409245	3723210	3.7	36.6	457	24.1	5.49
	Stack 4	409522	3723157	3.7	36.6	457	24.1	5.49
	Stack 5	409522	3723194	3.7	36.6	457	24.1	5.49
	Stack 6	409522	3723230	3.7	36.6	457	24.1	5.49
2	Stack 1	409185	3723252	3.7	36.6	474	25.0	5.49
	Stack 2	409216	3723231	3.7	36.6	474	25.0	5.49
	Stack 3	409245	3723210	3.7	36.6	474	25.0	5.49
	Stack 4	409522	3723157	3.7	36.6	474	25.0	5.49
	Stack 5	409522	3723194	3.7	36.6	474	25.0	5.49
	Stack 6	409522	3723230	3.7	36.6	474	25.0	5.49
3	Stack 1	409185	3723252	3.7	36.6	470	22.4	5.49
	Stack 2	409216	3723231	3.7	36.6	470	22.4	5.49
	Stack 3	409245	3723210	3.7	36.6	470	22.4	5.49
	Stack 4	409522	3723157	3.7	36.6	470	22.4	5.49
	Stack 5	409522	3723194	3.7	36.6	470	22.4	5.49
	Stack 6	409522	3723230	3.7	36.6	470	22.4	5.49
4	Stack 1	409185	3723252	3.7	36.6	467	19.5	5.49
	Stack 2	409216	3723231	3.7	36.6	467	19.5	5.49
	Stack 3	409245	3723210	3.7	36.6	467	19.5	5.49
	Stack 4	409522	3723157	3.7	36.6	467	19.5	5.49
	Stack 5	409522	3723194	3.7	36.6	467	19.5	5.49
	Stack 6	409522	3723230	3.7	36.6	467	19.5	5.49
5	Stack 1	409185	3723252	3.7	36.6	463	17.5	5.49
	Stack 2	409216	3723231	3.7	36.6	463	17.5	5.49
	Stack 3	409245	3723210	3.7	36.6	463	17.5	5.49
	Stack 4	409522	3723157	3.7	36.6	463	17.5	5.49
	Stack 5	409522	3723194	3.7	36.6	463	17.5	5.49
	Stack 6	409522	3723230	3.7	36.6	463	17.5	5.49
6	Stack 1	409185	3723252	3.7	36.6	454	22.6	5.49
	Stack 2	409216	3723231	3.7	36.6	454	22.6	5.49
	Stack 3	409245	3723210	3.7	36.6	454	22.6	5.49
	Stack 4	409522	3723157	3.7	36.6	454	22.6	5.49
	Stack 5	409522	3723194	3.7	36.6	454	22.6	5.49
	Stack 6	409522	3723230	3.7	36.6	454	22.6	5.49
7	Stack 1	409185	3723252	3.7	36.6	471	23.6	5.49
	Stack 2	409216	3723231	3.7	36.6	471	23.6	5.49
	Stack 3	409245	3723210	3.7	36.6	471	23.6	5.49
	Stack 4	409522	3723157	3.7	36.6	471	23.6	5.49
	Stack 5	409522	3723194	3.7	36.6	471	23.6	5.49
	Stack 6	409522	3723230	3.7	36.6	471	23.6	5.49
8	Stack 1	409185	3723252	3.7	36.6	467	21.3	5.49
	Stack 2	409216	3723231	3.7	36.6	467	21.3	5.49
	Stack 3	409245	3723210	3.7	36.6	467	21.3	5.49
	Stack 4	409522	3723157	3.7	36.6	467	21.3	5.49
	Stack 5	409522	3723194	3.7	36.6	467	21.3	5.49
	Stack 6	409522	3723230	3.7	36.6	467	21.3	5.49

Huntington Beach Energy Project
Attachment DR104-2 Table 8
Operational Modeling Parameters - Stack Parameters
May 2013

Point Sources

Scenario	Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
9	Stack 1	409185	3723252	3.7	36.6	463	19.2	5.49
	Stack 2	409216	3723231	3.7	36.6	463	19.2	5.49
	Stack 3	409245	3723210	3.7	36.6	463	19.2	5.49
	Stack 4	409522	3723157	3.7	36.6	463	19.2	5.49
	Stack 5	409522	3723194	3.7	36.6	463	19.2	5.49
	Stack 6	409522	3723230	3.7	36.6	463	19.2	5.49
10	Stack 1	409185	3723252	3.7	36.6	460	16.7	5.49
	Stack 2	409216	3723231	3.7	36.6	460	16.7	5.49
	Stack 3	409245	3723210	3.7	36.6	460	16.7	5.49
	Stack 4	409522	3723157	3.7	36.6	460	16.7	5.49
	Stack 5	409522	3723194	3.7	36.6	460	16.7	5.49
	Stack 6	409522	3723230	3.7	36.6	460	16.7	5.49
11	Stack 1	409185	3723252	3.7	36.6	455	21.8	5.49
	Stack 2	409216	3723231	3.7	36.6	455	21.8	5.49
	Stack 3	409245	3723210	3.7	36.6	455	21.8	5.49
	Stack 4	409522	3723157	3.7	36.6	455	21.8	5.49
	Stack 5	409522	3723194	3.7	36.6	455	21.8	5.49
	Stack 6	409522	3723230	3.7	36.6	455	21.8	5.49
12	Stack 1	409185	3723252	3.7	36.6	472	22.7	5.49
	Stack 2	409216	3723231	3.7	36.6	472	22.7	5.49
	Stack 3	409245	3723210	3.7	36.6	472	22.7	5.49
	Stack 4	409522	3723157	3.7	36.6	472	22.7	5.49
	Stack 5	409522	3723194	3.7	36.6	472	22.7	5.49
	Stack 6	409522	3723230	3.7	36.6	472	22.7	5.49
13	Stack 1	409185	3723252	3.7	36.6	465	19.0	5.49
	Stack 2	409216	3723231	3.7	36.6	465	19.0	5.49
	Stack 3	409245	3723210	3.7	36.6	465	19.0	5.49
	Stack 4	409522	3723157	3.7	36.6	465	19.0	5.49
	Stack 5	409522	3723194	3.7	36.6	465	19.0	5.49
	Stack 6	409522	3723230	3.7	36.6	465	19.0	5.49
14	Stack 1	409185	3723252	3.7	36.6	463	17.3	5.49
	Stack 2	409216	3723231	3.7	36.6	463	17.3	5.49
	Stack 3	409245	3723210	3.7	36.6	463	17.3	5.49
	Stack 4	409522	3723157	3.7	36.6	463	17.3	5.49
	Stack 5	409522	3723194	3.7	36.6	463	17.3	5.49
	Stack 6	409522	3723230	3.7	36.6	463	17.3	5.49
15	Stack 1	409185	3723252	3.7	36.6	461	15.4	5.49
	Stack 2	409216	3723231	3.7	36.6	461	15.4	5.49
	Stack 3	409245	3723210	3.7	36.6	461	15.4	5.49
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49

Huntington Beach Energy Project
Attachment DR104-2 Table 9
Operational Modeling Parameters - Emission Rates
May 2013

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

Source ID	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
	(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)
Stack 1	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 2	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 3	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 4	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 5	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 6	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50

Emission Rates for Annual Modeling

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Stack 1	1.16	9.22	0.48	3.78	0.48	3.78
Stack 2	1.16	9.22	0.48	3.78	0.48	3.78
Stack 3	1.16	9.22	0.48	3.78	0.48	3.78
Stack 4	1.16	9.22	0.48	3.78	0.48	3.78
Stack 5	1.16	9.22	0.48	3.78	0.48	3.78
Stack 6	1.16	9.22	0.48	3.78	0.48	3.78

Huntington Beach Energy Project
Attachment DR104-2 Table 10
Operational Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)
Admin	2	1	3.66	3.35	16	409290	3723286	409355	3723240	409351	3723235	409348	3723237	409338	3723223	409343	3723219
Admin	*	2	*	5.18	14	409287	3723281	409348	3723237	409338	3723223	409343	3723219	409333	3723205	409321	3723213
adminnew	1	1	3.66	12.19	4	409288	3723182	409306	3723169	409288	3723144	409271	3723157				
Maint	1	1	3.66	10.67	4	409308	3723165	409323	3723154	409310	3723137	409295	3723147				
STG2	1	1	3.66	12.19	4	409165	3723276	409180	3723266	409170	3723252	409156	3723262				
ACC2	1	1	3.66	31.70	4	409212	3723305	409263	3723269	409241	3723237	409189	3723274				
ACC1	1	1	3.66	31.70	4	409474	3723311	409536	3723311	409537	3723274	409474	3723274				
STG1	1	1	3.66	12.19	4	409538	3723247	409556	3723247	409556	3723231	409538	3723231				
CTG4	1	1	3.66	28.04	4	409500	3723162	409517	3723162	409517	3723149	409500	3723150				
CTG5	1	1	3.66	28.04	4	409500	3723198	409517	3723198	409517	3723186	409500	3723186				
CTG6	1	1	3.66	28.04	4	409499	3723236	409517	3723236	409517	3723223	409499	3723224				
CTG1	1	1	3.66	28.04	4	409166	3723235	409176	3723252	409188	3723244	409178	3723228				
CTG2	1	1	3.66	28.04	4	409197	3723216	409207	3723232	409219	3723224	409209	3723208				
CTG3	1	1	3.66	28.04	4	409226	3723194	409236	3723210	409247	3723203	409237	3723187				
AIRIN6	1	1	3.66	11.61	6	409470	3723211	409470	3723215	409475	3723225	409477	3723225	409482	3723215	409482	3723210
AIRIN5	1	1	3.66	11.61	6	409471	3723174	409471	3723178	409476	3723188	409478	3723188	409483	3723178	409483	3723174
AIRIN4	1	1	3.66	11.61	6	409471	3723136	409471	3723141	409476	3723151	409478	3723151	409483	3723140	409483	3723136
AIRIN1	1	1	3.66	11.61	6	409172	3723196	409169	3723199	409163	3723209	409164	3723211	409176	3723208	409179	3723206
AIRIN2	1	1	3.66	11.61	6	409202	3723175	409199	3723178	409194	3723188	409195	3723190	409206	3723187	409209	3723185
AIRIN3	1	1	3.66	11.61	6	409232	3723154	409229	3723157	409224	3723167	409225	3723169	409236	3723166	409239	3723164

Huntington Beach Energy Project
Attachment DR104-2 Table 10
Operational Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)	Corner 10 East (X) (m)	Corner 10 North (Y) (m)	Corner 11 East (X) (m)	Corner 11 North (Y) (m)	Corner 12 East (X) (m)	Corner 12 North (Y) (m)
Admin	2	1	3.66	3.35	16	409333	3723205	409321	3723213	409323	3723216	409296	3723237	409296	3723237	409292	3723241
Admin	*	2	*	5.18	14	409323	3723216	409296	3723237	409296	3723237	409292	3723241	409293	3723243	409279	3723252
adminnew	1	1	3.66	12.19	4												
Maint	1	1	3.66	10.67	4												
STG2	1	1	3.66	12.19	4												
ACC2	1	1	3.66	31.70	4												
ACC1	1	1	3.66	31.70	4												
STG1	1	1	3.66	12.19	4												
CTG4	1	1	3.66	28.04	4												
CTG5	1	1	3.66	28.04	4												
CTG6	1	1	3.66	28.04	4												
CTG1	1	1	3.66	28.04	4												
CTG2	1	1	3.66	28.04	4												
CTG3	1	1	3.66	28.04	4												
AIRIN6	1	1	3.66	11.61	6												
AIRIN5	1	1	3.66	11.61	6												
AIRIN4	1	1	3.66	11.61	6												
AIRIN1	1	1	3.66	11.61	6												
AIRIN2	1	1	3.66	11.61	6												
AIRIN3	1	1	3.66	11.61	6												

Huntington Beach Energy Project
Attachment DR104-2 Table 10
Operational Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 13 East (X) (m)	Corner 13 North (Y) (m)	Corner 14 East (X) (m)	Corner 14 North (Y) (m)	Corner 15 East (X) (m)	Corner 15 North (Y) (m)	Corner 16 East (X) (m)	Corner 16 North (Y) (m)
Admin	2	1	3.66	3.35	16	409293	3723243	409279	3723252	409292	3723270	409283	3723276
Admin	*	2	*	5.18	14	409292	3723270	409283	3723276				
adminnew	1	1	3.66	12.19	4								
Maint	1	1	3.66	10.67	4								
STG2	1	1	3.66	12.19	4								
ACC2	1	1	3.66	31.70	4								
ACC1	1	1	3.66	31.70	4								
STG1	1	1	3.66	12.19	4								
CTG4	1	1	3.66	28.04	4								
CTG5	1	1	3.66	28.04	4								
CTG6	1	1	3.66	28.04	4								
CTG1	1	1	3.66	28.04	4								
CTG2	1	1	3.66	28.04	4								
CTG3	1	1	3.66	28.04	4								
AIRIN6	1	1	3.66	11.61	6								
AIRIN5	1	1	3.66	11.61	6								
AIRIN4	1	1	3.66	11.61	6								
AIRIN1	1	1	3.66	11.61	6								
AIRIN2	1	1	3.66	11.61	6								
AIRIN3	1	1	3.66	11.61	6								

Huntington Beach Energy Project
Attachment DR104-2 Table 11
Operational Modeling Results Summary
May 2013

Case 1: 32°F, 100% Load with Duct Burner Firing

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.1	-	112	26.1	2.60	1.61	1.04	3.73	-	3.73	-
2006	14.7	-	81.9	26.0	1.90	1.42	1.05	3.76	-	3.76	-
2007	16.1	-	89.9	26.0	2.08	1.60	1.03	3.72	-	3.72	-
2008	13.6	-	75.8	19.6	1.76	1.47	0.61	2.18	-	2.18	-
2009	21.3	-	119	25.9	2.76	1.50	0.99	3.55	-	3.55	-

Case 2: 32°F, 100% Load

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	19.8	-	111	25.3	1.92	1.18	0.77	1.75	-	1.75	-
2006	14.0	-	78.3	25.2	1.35	1.06	0.78	1.77	-	1.77	-
2007	15.2	-	85.2	25.3	1.47	1.06	0.77	1.75	-	1.75	-
2008	12.9	-	72.1	19.0	1.25	1.05	0.45	1.02	-	1.02	-
2009	20.6	-	115	25.2	1.99	1.09	0.73	1.67	-	1.67	-

Case 3: 32°F, 90% Load

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.2	-	113	25.1	1.77	1.10	0.71	1.77	-	1.77	-
2006	14.8	-	82.8	25.1	1.30	0.96	0.71	1.79	-	1.79	-
2007	16.4	-	91.9	25.0	1.44	1.10	0.70	1.76	-	1.76	-
2008	14.1	-	78.7	18.8	1.24	1.02	0.41	1.04	-	1.04	-
2009	21.5	-	120	25.0	1.88	1.03	0.67	1.68	-	1.68	-

Case 4: 32°F, 80% Load

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.6	-	115	24.9	1.62	1.01	0.64	1.80	-	1.80	-
2006	15.8	-	88.2	24.9	1.24	0.86	0.64	1.81	-	1.81	-
2007	18.0	-	101	24.8	1.41	1.08	0.63	1.78	-	1.78	-
2008	17.7	-	98.6	19.1	1.39	1.02	0.38	1.08	-	1.08	-
2009	22.6	-	126	24.8	1.77	0.96	0.60	1.70	-	1.70	-

Case 5: 32°F, 70% Load

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	21.0	-	117	25.1	1.50	0.94	0.59	1.82	-	1.82	-
2006	20.6	-	115	24.8	1.48	0.82	0.59	1.83	-	1.83	-
2007	20.5	-	114	26.8	1.47	1.07	0.58	1.79	-	1.79	-
2008	19.1	-	107	21.6	1.37	1.02	0.36	1.12	-	1.12	-
2009	23.3	-	130	24.6	1.67	0.90	0.56	1.71	-	1.71	-

Case 6: 66°F, 100% Load with Duct Burner Firing

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.3	-	114	25.9	2.50	1.56	0.99	3.76	-	3.76	-
2006	15.2	-	84.7	25.9	1.87	1.35	1.00	3.78	-	3.78	-
2007	16.9	-	94.4	25.9	2.08	1.59	0.99	3.73	-	3.73	-
2008	14.3	-	79.8	19.5	1.76	1.47	0.59	2.23	-	2.23	-
2009	21.9	-	122	25.8	2.69	1.46	0.94	3.56	-	3.56	-

Case 7: 66°F, 100% Load

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.0	1.39	112	25.1	1.82	1.12	0.72	1.76	0.76	1.76	0.76
2006	14.5	1.36	80.8	25.1	1.31	1.00	0.73	1.78	0.74	1.78	0.74
2007	15.9	0.99	88.8	25.1	1.44	1.10	0.72	1.76	0.54	1.76	0.54
2008	13.3	0.66	74.5	18.9	1.21	1.01	0.42	1.03	0.36	1.03	0.36
2009	21.1	1.07	118	25.0	1.91	1.05	0.69	1.68	0.59	1.68	0.59

Case 8: 66°F, 90% Load

Year	NO_2 (µg/m^3) [a]		CO (µg/m^3)		SO_2 (µg/m^3)			PM_{10} (µg/m^3)		$PM_{2.5}$ (µg/m^3)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.3	1.31	114	25.0	1.67	1.04	0.66	1.78	0.77	1.78	0.77
2006	15.2	1.29	85.1	25.0	1.25	0.90	0.66	1.79	0.76	1.79	0.76
2007	17.1	0.94	95.4	24.9	1.40	1.07	0.66	1.77	0.55	1.77	0.55
2008	15.2	0.64	85.1	18.8	1.25	1.00	0.39	1.06	0.37	1.06	0.37
2009	21.9	1.02	123	24.8	1.80	0.97	0.63	1.69	0.60	1.69	0.60

Huntington Beach Energy Project
Attachment DR104-2 Table 11
Operational Modeling Results Summary
May 2013

Case 9: 66°F, 80% Load

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.7	1.25	116	24.9	1.54	0.96	0.61	1.80	0.79	1.80	0.79
2006	16.0	1.23	89.2	24.8	1.19	0.82	0.61	1.81	0.77	1.81	0.77
2007	18.3	0.90	102	25.1	1.36	1.04	0.60	1.78	0.57	1.78	0.57
2008	17.9	0.62	100	19.4	1.34	0.99	0.37	1.09	0.39	1.09	0.39
2009	22.7	0.98	127	24.7	1.69	0.91	0.57	1.70	0.62	1.70	0.62

Case 10: 66°F, 70% Load

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	21.2	1.20	118	25.1	1.41	0.88	0.55	1.83	0.81	1.83	0.81
2006	24.6	1.18	138	24.7	1.64	0.85	0.56	1.84	0.79	1.84	0.79
2007	20.7	0.87	116	28.4	1.38	1.03	0.54	1.79	0.59	1.79	0.59
2008	21.6	0.61	121	22.5	1.44	0.99	0.34	1.14	0.41	1.14	0.41
2009	23.7	0.95	133	24.5	1.58	0.85	0.52	1.72	0.64	1.72	0.64

Case 11: 110°F, 100% Load with Duct Burner Firing

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.4	-	114	25.9	2.45	1.53	0.97	3.77	-	3.77	-
2006	15.4	-	86.0	25.9	1.85	1.32	0.98	3.79	-	3.79	-
2007	17.3	-	96.5	25.8	2.07	1.59	0.96	3.74	-	3.74	-
2008	15.4	-	86.0	19.4	1.85	1.48	0.58	2.24	-	2.24	-
2009	22.1	-	124	25.7	2.66	1.44	0.92	3.57	-	3.57	-

Case 12: 110°F, 100% Load

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.1	-	112	25.0	1.76	1.09	0.70	1.77	-	1.77	-
2006	14.7	-	82.0	25.0	1.28	0.96	0.71	1.78	-	1.78	-
2007	16.2	-	90.8	25.0	1.42	1.08	0.70	1.76	-	1.76	-
2008	13.8	-	77.0	18.8	1.20	1.00	0.41	1.04	-	1.04	-
2009	21.3	-	119	24.9	1.86	1.02	0.66	1.68	-	1.68	-

Case 13: 110°F, 90% Load

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	20.7	-	116	24.9	1.48	0.93	0.59	1.81	-	1.81	-
2006	16.0	-	89.4	24.8	1.14	0.79	0.59	1.81	-	1.81	-
2007	18.3	-	103	25.2	1.31	1.00	0.58	1.78	-	1.78	-
2008	18.0	-	101	19.7	1.29	0.96	0.35	1.09	-	1.09	-
2009	22.8	-	127	24.6	1.63	0.88	0.55	1.70	-	1.70	-

Case 14: 110°F, 80% Load

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	21.0	-	118	25.0	1.37	0.86	0.54	1.82	-	1.82	-
2006	22.4	-	125	24.7	1.46	0.76	0.54	1.83	-	1.83	-
2007	20.8	-	116	27.0	1.36	0.98	0.53	1.79	-	1.79	-
2008	19.4	-	108	21.8	1.26	0.94	0.33	1.12	-	1.12	-
2009	23.4	-	131	24.5	1.53	0.82	0.51	1.71	-	1.71	-

Case 15: 110°F, 70% Load

Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
2005	21.4	-	120	25.1	1.27	0.80	0.50	1.84	-	1.84	-
2006	29.9	-	167	24.6	1.77	0.89	0.50	1.86	-	1.86	-
2007	21.8	-	122	30.9	1.29	0.97	0.48	1.79	-	1.79	-
2008	23.1	-	129	23.5	1.37	0.95	0.31	1.16	-	1.16	-
2009	24.2	-	135	24.4	1.44	0.76	0.46	1.72	-	1.72	-

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

Huntington Beach Energy Project
Attachment DR104-2 Table 12
SCAQMD Rule 2005 NO_2 Modeling Results Summary [a]
May 2013

Stack 1

Year	1-hr Concentration (µg/m³)	Annual Concentration (µg/m³)
2005	4.19	0.24
2006	8.32	0.24
2007	5.51	0.17
2008	11.1	0.12
2009	11.9	0.19

Stack 2

Year	1-hr Concentration (µg/m³)	Annual Concentration (µg/m³)
2005	16.5	0.24
2006	21.4	0.24
2007	19.0	0.17
2008	14.3	0.11
2009	15.5	0.19

Stack 3

Year	1-hr Concentration (µg/m³)	Annual Concentration (µg/m³)
2005	7.3	0.24
2006	9.0	0.24
2007	15.0	0.17
2008	18.8	0.11
2009	14.3	0.19

Stack 4

Year	1-hr Concentration (µg/m³)	Annual Concentration (µg/m³)
2005	3.59	0.24
2006	2.91	0.24
2007	3.53	0.17
2008	3.41	0.11
2009	4.10	0.19

Stack 5

Year	1-hr Concentration (µg/m³)	Annual Concentration (µg/m³)
2005	3.58	0.24
2006	2.92	0.24
2007	3.50	0.17
2008	3.33	0.11
2009	4.06	0.19

Stack 6

Year	1-hr Concentration (µg/m³)	Annual Concentration (µg/m³)
2005	3.59	0.24
2006	5.02	0.24
2007	3.45	0.17
2008	3.35	0.11
2009	4.06	0.19

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

Huntington Beach Energy Project
Attachment DR104-2 Table 13
Class I SIL and Increment Modeling Results
May 2013

Annual NO_2 Concentrations at 50 km Receptor Ring

Year	2005	2006	2007	2008	2009
All	0.036	0.037	0.028	0.022	0.027
Stack 1	0.0060	0.0062	0.0047	0.0037	0.0045
Stack 2	0.0060	0.0062	0.0047	0.0037	0.0045
Stack 3	0.0060	0.0062	0.0047	0.0037	0.0045
Stack 4	0.0060	0.0062	0.0047	0.0037	0.0046
Stack 5	0.0060	0.0062	0.0047	0.0037	0.0046
Stack 6	0.0060	0.0062	0.0047	0.0037	0.0046

Attachment DR104-3
Supporting Documentation for Cumulative Impacts Analysis

Huntington Beach Energy Project
Attachment DR104-3 Table 1
Cumulative Modeling Parameters - Stack Parameters
May 2013

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 (1-hr NO_2, CO)	Stack 1	409185	3723252	3.7	36.6	461	15.4	5.49
	Stack 2	409216	3723231	3.7	36.6	461	15.4	5.49
	Stack 3	409245	3723210	3.7	36.6	461	15.4	5.49
	Stack 4	409522	3723157	3.7	36.6	461	15.4	5.49
	Stack 5	409522	3723194	3.7	36.6	461	15.4	5.49
	Stack 6	409522	3723230	3.7	36.6	461	15.4	5.49
HBEP (SO_2)	Stack 1	409185	3723252	3.7	36.6	457	24.1	5.49
	Stack 2	409216	3723231	3.7	36.6	457	24.1	5.49
	Stack 3	409245	3723210	3.7	36.6	457	24.1	5.49
	Stack 4	409522	3723157	3.7	36.6	457	24.1	5.49
	Stack 5	409522	3723194	3.7	36.6	457	24.1	5.49
	Stack 6	409522	3723230	3.7	36.6	457	24.1	5.49
HBEP (24-hr PM_{10}, 24-hr $PM_{2.5}$)	Stack 1	409185	3723252	3.7	36.6	455	21.8	5.49
	Stack 2	409216	3723231	3.7	36.6	455	21.8	5.49
	Stack 3	409245	3723210	3.7	36.6	455	21.8	5.49
	Stack 4	409522	3723157	3.7	36.6	455	21.8	5.49
	Stack 5	409522	3723194	3.7	36.6	455	21.8	5.49
	Stack 6	409522	3723230	3.7	36.6	455	21.8	5.49
HBEP (Annual NOx)	Stack 1	409185	3723252	3.7	36.6	471	23.6	5.49
	Stack 2	409216	3723231	3.7	36.6	471	23.6	5.49
	Stack 3	409245	3723210	3.7	36.6	471	23.6	5.49
	Stack 4	409522	3723157	3.7	36.6	471	23.6	5.49
	Stack 5	409522	3723194	3.7	36.6	471	23.6	5.49
	Stack 6	409522	3723230	3.7	36.6	471	23.6	5.49
HBEP (Annual PM_{10}, Annual $PM_{2.5}$)	Stack 1	409185	3723252	3.7	36.6	460	16.7	5.49
	Stack 2	409216	3723231	3.7	36.6	460	16.7	5.49
	Stack 3	409245	3723210	3.7	36.6	460	16.7	5.49
	Stack 4	409522	3723157	3.7	36.6	460	16.7	5.49
	Stack 5	409522	3723194	3.7	36.6	460	16.7	5.49
	Stack 6	409522	3723230	3.7	36.6	460	16.7	5.49
OC Sanitation 1	OC11	412725	3728250	7.7	18.9	533	17.9	0.76
	OC12	412725	3728250	7.7	12.8	455	9.3	0.46
OC Sanitation 2	OC22	411100	3722400	1.6	8.5	587	33.9	0.39
Arlon Graphics	AG	414875	3730325	13.5	7.6	364	24.5	1.32

Huntington Beach Energy Project
Attachment DR104-3 Table 2
Cumulative Modeling Parameters - Emission Rates
May 2013

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

Source ID	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
	(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)
Stack 1	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 2	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 3	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 4	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 5	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 6	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
OC11	2.90	23.01	6.94	55.1	6.94	55.1	0.28	2.25	0.28	2.25	0.28	2.25	0.28	2.25	0.28	2.25
OC12	0.03	0.22	0.11	0.90	0.11	0.90	0.016	0.13	0.016	0.13	0.016	0.13	0.007	0.056	0.0071	0.056
OC22	-	-	-	-	2.60	20.6	-	-	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	0.0021	0.017	0.0021	0.017

Emission Rates for Annual Modeling

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(tpy)	(g/s)	(tpy)	(g/s)	(tpy)
Stack 1	1.16	40.4	0.48	16.6	0.48	16.6
Stack 2	1.16	40.4	0.48	16.6	0.48	16.6
Stack 3	1.16	40.4	0.48	16.6	0.48	16.6
Stack 4	1.16	40.4	0.48	16.6	0.48	16.6
Stack 5	1.16	40.4	0.48	16.6	0.48	16.6
Stack 6	1.16	40.4	0.48	16.6	0.48	16.6
OC11	1.93	67.2	0.19	6.57	0.19	6.57
OC12	0.046	1.60	0.017	0.60	0.017	0.60
OC22	0.15	5.38	0.0049	0.17	0.0049	0.17
AG	-	-	0.0021	0.073	0.0021	0.073

Huntington Beach Energy Project
Attachment DR104-3 Table 3
Cumulative Modeling Results Summary
May 2013

Source Group	Year	NO_2 ($\mu g/m^3$)			CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
		1-hr [a]	Federal 1-hr [b]	Annual [a]	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
ALL	2005	21.9	114	1.53	121	35.5	2.67	3.35	1.08	3.83	0.83	3.83	0.83
	2006	29.9	116	1.50	167	45.4	2.10	3.01	1.08	3.84	0.81	3.84	0.81
	2007	21.8	116	1.12	122	34.4	2.13	2.73	1.07	3.78	0.60	3.78	0.60
	2008	23.1	112	0.91	129	48.5	2.27	3.28	0.74	2.28	0.42	2.28	0.42
	2009	24.7	112	1.19	137	36.8	2.82	2.95	1.03	3.62	0.65	3.62	0.65
HBEP	2005	21.4	21.4	1.39	120	25.1	2.60	1.61	1.04	3.77	0.81	3.77	0.81
	2006	29.9	29.9	1.36	167	24.6	1.90	1.42	1.05	3.79	0.79	3.79	0.79
	2007	21.8	21.8	0.99	122	30.9	2.08	1.60	1.03	3.74	0.59	3.74	0.59
	2008	23.1	23.1	0.66	129	23.5	1.76	1.47	0.61	2.24	0.41	2.24	0.41
	2009	24.2	24.2	1.07	135	24.4	2.76	1.50	0.99	3.57	0.64	3.57	0.64
OC1	2005	15.4	15.4	0.95	46.5	24.7	2.03	1.49	0.58	0.54	0.15	0.54	0.15
	2006	16.1	16.1	0.96	48.6	26.0	2.10	1.30	0.59	0.56	0.15	0.56	0.15
	2007	15.4	15.4	0.87	47.0	21.9	2.13	1.37	0.61	0.59	0.14	0.59	0.14
	2008	17.3	17.3	0.76	52.2	37.9	2.27	1.81	0.74	0.71	0.12	0.71	0.12
	2009	20.2	20.2	0.90	61.1	24.5	2.67	1.75	0.59	0.54	0.14	0.54	0.14
OC2	2005	-	-	0.22	-	35.4	-	3.34	0.186	0.404	0.009	0.404	0.009
	2006	-	-	0.24	-	45.1	-	3.01	0.171	0.373	0.010	0.373	0.010
	2007	-	-	0.20	-	34.4	-	2.73	0.173	0.377	0.008	0.377	0.008
	2008	-	-	0.20	-	48.5	-	3.26	0.189	0.411	0.008	0.411	0.008
	2009	-	-	0.21	-	36.8	-	2.95	0.115	0.250	0.009	0.250	0.009
AG	2005	-	-	-	0.36	0.23	0.0022	0.0020	0.0007	0.0052	0.0024	0.0052	0.0024
	2006	-	-	-	0.40	0.27	0.0024	0.0020	0.0009	0.0072	0.0023	0.0072	0.0023
	2007	-	-	-	0.57	0.25	0.0035	0.0026	0.0010	0.0078	0.0021	0.0078	0.0021
	2008	-	-	-	0.45	0.26	0.0028	0.0021	0.0009	0.0069	0.0021	0.0069	0.0021
	2009	-	-	-	0.57	0.25	0.0035	0.0021	0.0007	0.0054	0.0020	0.0054	0.0020

[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 maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.

Attachment DR104-4
Supporting Documentation for
Construction Overlap Impacts Analysis

Huntington Beach Energy Project
Attachment DR104-4 Table 1
Block 1 Operation and Block 2 Construction Source Parameters for AERMOD Input
May 2013

Point Sources

Pollutant	Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
1-hr NO_2, CO	Stack 4	Default	409522	3723157	3.66	36.6	461	15.4	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	461	15.4	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	461	15.4	5.49
SO2	Stack 4	Default	409522	3723157	3.66	36.6	457	24.1	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	457	24.1	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	457	24.1	5.49
24-hr PM_{10}, 24-hr $PM_{2.5}$	Stack 4	Default	409522	3723157	3.66	36.6	455	21.8	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	455	21.8	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	455	21.8	5.49
Annual NO_2	Stack 4	Default	409522	3723157	3.66	36.6	471	23.6	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	471	23.6	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	471	23.6	5.49
Annual PM_{10}, Annual $PM_{2.5}$	Stack 4	Default	409522	3723157	3.66	36.6	460	16.7	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	460	16.7	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	460	16.7	5.49
All	W01	Horizontal	409086	3723188	3.7	4.6	533	18	0.127
All	W02	Horizontal	409103	3723177	3.7	4.6	533	18	0.127
All	W03	Horizontal	409120	3723165	3.7	4.6	533	18	0.127
All	W04	Horizontal	409136	3723153	3.7	4.6	533	18	0.127
All	W05	Horizontal	409153	3723142	3.7	4.6	533	18	0.127
All	W06	Horizontal	409169	3723130	3.7	4.6	533	18	0.127
All	W07	Horizontal	409186	3723119	3.7	4.6	533	18	0.127
All	W08	Horizontal	409203	3723107	3.7	4.6	533	18	0.127
All	W09	Horizontal	409099	3723207	3.7	4.6	533	18	0.127
All	W10	Horizontal	409116	3723195	3.7	4.6	533	18	0.127
All	W11	Horizontal	409132	3723184	3.7	4.6	533	18	0.127
All	W12	Horizontal	409149	3723172	3.7	4.6	533	18	0.127
All	W13	Horizontal	409165	3723160	3.7	4.6	533	18	0.127
All	W14	Horizontal	409182	3723149	3.7	4.6	533	18	0.127
All	W15	Horizontal	409199	3723137	3.7	4.6	533	18	0.127
All	W16	Horizontal	409215	3723126	3.7	4.6	533	18	0.127
All	W17	Horizontal	409112	3723226	3.7	4.6	533	18	0.127
All	W18	Horizontal	409128	3723214	3.7	4.6	533	18	0.127
All	W19	Horizontal	409145	3723202	3.7	4.6	533	18	0.127
All	W20	Horizontal	409162	3723191	3.7	4.6	533	18	0.127
All	W21	Horizontal	409178	3723179	3.7	4.6	533	18	0.127
All	W22	Horizontal	409195	3723168	3.7	4.6	533	18	0.127
All	W23	Horizontal	409211	3723156	3.7	4.6	533	18	0.127
All	W24	Horizontal	409228	3723144	3.7	4.6	533	18	0.127
All	W25	Horizontal	409124	3723244	3.7	4.6	533	18	0.127
All	W26	Horizontal	409141	3723233	3.7	4.6	533	18	0.127
All	W27	Horizontal	409158	3723221	3.7	4.6	533	18	0.127
All	W28	Horizontal	409174	3723209	3.7	4.6	533	18	0.127
All	W29	Horizontal	409191	3723198	3.7	4.6	533	18	0.127
All	W30	Horizontal	409207	3723186	3.7	4.6	533	18	0.127
All	W31	Horizontal	409224	3723175	3.7	4.6	533	18	0.127
All	W32	Horizontal	409241	3723163	3.7	4.6	533	18	0.127
All	W33	Horizontal	409137	3723263	3.7	4.6	533	18	0.127
All	W34	Horizontal	409154	3723251	3.7	4.6	533	18	0.127
All	W35	Horizontal	409170	3723240	3.7	4.6	533	18	0.127
All	W36	Horizontal	409187	3723228	3.7	4.6	533	18	0.127
All	W37	Horizontal	409204	3723217	3.7	4.6	533	18	0.127
All	W38	Horizontal	409220	3723205	3.7	4.6	533	18	0.127
All	W39	Horizontal	409237	3723193	3.7	4.6	533	18	0.127
All	W40	Horizontal	409253	3723182	3.7	4.6	533	18	0.127
All	W41	Horizontal	409150	3723282	3.7	4.6	533	18	0.127
All	W42	Horizontal	409166	3723270	3.7	4.6	533	18	0.127
All	W43	Horizontal	409183	3723258	3.7	4.6	533	18	0.127
All	W44	Horizontal	409200	3723247	3.7	4.6	533	18	0.127
All	W45	Horizontal	409216	3723235	3.7	4.6	533	18	0.127
All	W46	Horizontal	409233	3723224	3.7	4.6	533	18	0.127
All	W47	Horizontal	409249	3723212	3.7	4.6	533	18	0.127
All	W48	Horizontal	409266	3723200	3.7	4.6	533	18	0.127
All	W49	Horizontal	409163	3723300	3.7	4.6	533	18	0.127
All	W50	Horizontal	409179	3723289	3.7	4.6	533	18	0.127
All	W51	Horizontal	409196	3723277	3.7	4.6	533	18	0.127

Huntington Beach Energy Project
Attachment DR104-4 Table 1
Block 1 Operation and Block 2 Construction Source Parameters for AERMOD Input
May 2013

Point Sources

Pollutant	Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
All	W52	Horizontal	409212	3723266	3.7	4.6	533	18	0.127
All	W53	Horizontal	409229	3723254	3.7	4.6	533	18	0.127
All	W54	Horizontal	409246	3723242	3.7	4.6	533	18	0.127
All	W55	Horizontal	409262	3723231	3.7	4.6	533	18	0.127
All	W56	Horizontal	409279	3723219	3.7	4.6	533	18	0.127
All	W57	Horizontal	409175	3723319	3.7	4.6	533	18	0.127
All	W58	Horizontal	409192	3723307	3.7	4.6	533	18	0.127
All	W59	Horizontal	409208	3723296	3.7	4.6	533	18	0.127
All	W60	Horizontal	409225	3723284	3.7	4.6	533	18	0.127
All	W61	Horizontal	409242	3723273	3.7	4.6	533	18	0.127
All	W62	Horizontal	409258	3723261	3.7	4.6	533	18	0.127
All	W63	Horizontal	409275	3723249	3.7	4.6	533	18	0.127
All	W64	Horizontal	409291	3723238	3.7	4.6	533	18	0.127
All	W65	Horizontal	409188	3723338	3.7	4.6	533	18	0.127
All	W66	Horizontal	409205	3723326	3.7	4.6	533	18	0.127
All	W67	Horizontal	409221	3723315	3.7	4.6	533	18	0.127
All	W68	Horizontal	409238	3723303	3.7	4.6	533	18	0.127
All	W69	Horizontal	409254	3723291	3.7	4.6	533	18	0.127
All	W70	Horizontal	409271	3723280	3.7	4.6	533	18	0.127
All	W71	Horizontal	409288	3723268	3.7	4.6	533	18	0.127
All	W72	Horizontal	409304	3723257	3.7	4.6	533	18	0.127

Area Sources

Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North	Vertical Dimension (m)
FUGW	409066	3723183	3.7	0.0	165	215	35	1.0

Huntington Beach Energy Project
Attachment DR104-4 Table 2
Block 1 Operation and Block 2 Construction Modeling Parameters - Emission Rates
May 2013

Emission Rates for 1-hr, 3-hr, 8-hr, and 24-hr Modeling [a,b]

Source ID	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
	(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)
Stack 4	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 5	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 6	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
W(1-72)	0.52	4.12	0.41	3.23	0.41	3.23	1.16E-03	9.17E-03	1.16E-03	9.17E-03	4.82E-04	3.82E-03	0.008	0.066	0.010	0.076
FUGW	-	-	-	-	-	-	-	-	-	-	-	-	0.050	0.400	0.0039	0.031
Maximum Month	48		48		48		48		48		48		46		48	

Emission Rates for Annual Modeling [a,b]

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Stack 4	1.16	9.22	0.48	3.78	0.48	3.78
Stack 5	1.16	9.22	0.48	3.78	0.48	3.78
Stack 6	1.16	9.22	0.48	3.78	0.48	3.78
W(1-72)	0.11	0.90	0.005	0.041	0.005	0.041
FUGW	-	-	0.030	0.24	0.003	0.024
Maximum Months	46-57		46-57		46-57	

[a] Emission rates for construction exhaust point sources, W(1-72) source group, are presented as the sum total for all sources in the group.

[b] Short term Block 1 operation emissions were obtained from AFC Table 5.1-24, submitted June 2012. Annual Block 1 operation emissions were obtained from DR12, submitted November 2012. Block 2 construction emissions were obtained from Table 5.1A.46R from Appendix 5.1AR, submitted on February 22, 2013 as Attachment DR75-1 to Data Responses, Set 2A.

Huntington Beach Energy Project
Attachment DR104-4 Table 3
Block 1 Operation and Block 2 Construction Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)
ACC1	1	1	3.66	31.7	4	409474	3723311	409536	3723311
STG1	1	1	3.66	12.2	4	409538	3723247	409556	3723247
CTG4	1	1	3.66	28.0	4	409500	3723162	409517	3723162
CTG5	1	1	3.66	28.0	4	409500	3723198	409517	3723198
CTG6	1	1	3.66	28.0	4	409499	3723236	409517	3723236
AIRIN6	1	1	3.66	11.6	6	409470	3723211	409470	3723215
AIRIN5	1	1	3.66	11.6	6	409471	3723174	409471	3723178
AIRIN4	1	1	3.66	11.6	6	409471	3723136	409471	3723141
B1	2	1	3.66	23.2	4	409293	3723102	409312	3723128
B1	*	2	*	37.6	4	409301	3723114	409312	3723128
B2	2	1	3.66	23.2	4	409252	3723127	409272	3723153
B2	*	2	*	37.6	4	409261	3723139	409272	3723153

Tank Name	Base Elevation (m)	Center East (X) (m)	Center North (Y) (m)	Tank Height (m)	Tank Diameter (m)
Stack12	3.66	409274	3723095	61.0	6.27

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Building Name	Corner 3 East (X) (m)	Corner 3 North (Y) (m)	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)
ACC1	409537	3723274	409474	3723274				
STG1	409556	3723231	409538	3723231				
CTG4	409517	3723149	409500	3723150				
CTG5	409517	3723186	409500	3723186				
CTG6	409517	3723223	409499	3723224				
AIRIN6	409475	3723225	409477	3723225	409482	3723215	409482	3723210
AIRIN5	409476	3723188	409478	3723188	409483	3723178	409483	3723174
AIRIN4	409476	3723151	409478	3723151	409483	3723140	409483	3723136
B1	409335	3723112	409317	3723086				
B1	409335	3723112	409326	3723098				
B2	409295	3723137	409277	3723111				
B2	409295	3723137	409285	3723123				

Tank Name
Stack12

Huntington Beach Energy Project
Attachment DR104-4 Table 4
Block 1 Operation and Block 2 Construction Modeling Results
May 2013

Source	Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
		1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
ALL		49.5	3.33	71.7	37.3	1.34	0.85	0.53	38.8	9.23	4.42	1.30
CONSTRUCTION	2005	49.5	2.86	48.6	37.2	0.14	0.12	0.03	37.7	8.98	3.30	1.05
OPERATION		10.7	0.72	60.0	12.6	1.30	0.81	0.52	1.90	0.42	1.90	0.42
ALL		49.7	3.31	62.3	36.7	0.97	0.75	0.54	37.0	9.21	4.57	1.29
CONSTRUCTION	2006	49.7	2.92	48.8	36.7	0.14	0.13	0.03	35.5	8.98	3.04	1.06
OPERATION		9.71	0.71	54.2	12.3	0.95	0.71	0.53	1.94	0.41	1.94	0.41
ALL		49.1	3.07	64.3	41.6	0.96	0.78	0.53	34.3	8.80	4.32	1.18
CONSTRUCTION	2007	49.1	2.80	48.2	41.5	0.14	0.12	0.03	32.9	8.64	2.87	1.02
OPERATION		9.94	0.51	55.6	12.8	0.92	0.78	0.52	1.89	0.30	1.89	0.30
ALL		49.4	3.02	62.0	34.5	0.86	0.75	0.32	27.0	9.01	2.74	1.14
CONSTRUCTION	2008	49.4	2.88	48.5	34.4	0.14	0.13	0.03	26.8	8.92	2.48	1.05
OPERATION		9.43	0.34	52.7	11.8	0.86	0.71	0.32	1.19	0.21	1.19	0.21
ALL		49.4	3.17	78.9	34.1	1.41	0.78	0.51	30.7	9.56	3.64	1.27
CONSTRUCTION	2009	49.4	2.89	48.5	34.1	0.14	0.12	0.03	30.1	9.38	2.70	1.09
OPERATION		12.2	0.56	68.0	12.2	1.38	0.75	0.49	1.79	0.34	1.79	0.34

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

Huntington Beach Energy Project
Attachment DR104-4 Table 5
HBEP Operation with Demolition of Units 1 and 2 Source Parameters for AERMOD Input
May 2013

Point Sources

Pollutant	Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
1-hr NO_2, CO	Stack 1	Default	409185	3723252	3.66	36.6	461	15.4	5.49
	Stack 2	Default	409216	3723231	3.66	36.6	461	15.4	5.49
	Stack 3	Default	409245	3723210	3.66	36.6	461	15.4	5.49
	Stack 4	Default	409522	3723157	3.66	36.6	461	15.4	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	461	15.4	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	461	15.4	5.49
SO_2, 24-hr PM_{10}, 24-hr $PM_{2.5}$	Stack 1	Default	409185	3723252	3.66	36.6	455	21.8	5.49
	Stack 2	Default	409216	3723231	3.66	36.6	455	21.8	5.49
	Stack 3	Default	409245	3723210	3.66	36.6	455	21.8	5.49
	Stack 4	Default	409522	3723157	3.66	36.6	455	21.8	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	455	21.8	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	455	21.8	5.49
Annual NO_2	Stack 1	Default	409185	3723252	3.66	36.6	471	23.6	5.49
	Stack 2	Default	409216	3723231	3.66	36.6	471	23.6	5.49
	Stack 3	Default	409245	3723210	3.66	36.6	471	23.6	5.49
	Stack 4	Default	409522	3723157	3.66	36.6	471	23.6	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	471	23.6	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	471	23.6	5.49
Annual PM_{10}, Annual $PM_{2.5}$	Stack 1	Default	409185	3723252	3.66	36.6	460	16.7	5.49
	Stack 2	Default	409216	3723231	3.66	36.6	460	16.7	5.49
	Stack 3	Default	409245	3723210	3.66	36.6	460	16.7	5.49
	Stack 4	Default	409522	3723157	3.66	36.6	460	16.7	5.49
	Stack 5	Default	409522	3723194	3.66	36.6	460	16.7	5.49
	Stack 6	Default	409522	3723230	3.66	36.6	460	16.7	5.49
All	S01	Horizontal	409219	3723095	3.66	4.60	533	18.0	0.127
All	S02	Horizontal	409236	3723084	3.66	4.60	533	18.0	0.127
All	S03	Horizontal	409252	3723072	3.66	4.60	533	18.0	0.127
All	S04	Horizontal	409269	3723061	3.66	4.60	533	18.0	0.127
All	S05	Horizontal	409286	3723049	3.66	4.60	533	18.0	0.127
All	S06	Horizontal	409302	3723037	3.66	4.60	533	18.0	0.127
All	S07	Horizontal	409232	3723114	3.66	4.60	533	18.0	0.127
All	S08	Horizontal	409248	3723102	3.66	4.60	533	18.0	0.127
All	S09	Horizontal	409265	3723091	3.66	4.60	533	18.0	0.127
All	S10	Horizontal	409282	3723079	3.66	4.60	533	18.0	0.127
All	S11	Horizontal	409298	3723068	3.66	4.60	533	18.0	0.127
All	S12	Horizontal	409315	3723056	3.66	4.60	533	18.0	0.127
All	S13	Horizontal	409245	3723133	3.66	4.60	533	18.0	0.127
All	S14	Horizontal	409261	3723121	3.66	4.60	533	18.0	0.127
All	S15	Horizontal	409278	3723110	3.66	4.60	533	18.0	0.127
All	S16	Horizontal	409294	3723098	3.66	4.60	533	18.0	0.127
All	S17	Horizontal	409311	3723086	3.66	4.60	533	18.0	0.127
All	S18	Horizontal	409328	3723075	3.66	4.60	533	18.0	0.127
All	S19	Horizontal	409257	3723151	3.66	4.60	533	18.0	0.127
All	S20	Horizontal	409274	3723140	3.66	4.60	533	18.0	0.127
All	S21	Horizontal	409290	3723128	3.66	4.60	533	18.0	0.127
All	S22	Horizontal	409307	3723117	3.66	4.60	533	18.0	0.127
All	S23	Horizontal	409324	3723105	3.66	4.60	533	18.0	0.127
All	S24	Horizontal	409340	3723093	3.66	4.60	533	18.0	0.127
All	S25	Horizontal	409270	3723170	3.66	4.60	533	18.0	0.127
All	S26	Horizontal	409287	3723159	3.66	4.60	533	18.0	0.127
All	S27	Horizontal	409303	3723147	3.66	4.60	533	18.0	0.127
All	S28	Horizontal	409320	3723135	3.66	4.60	533	18.0	0.127
All	S29	Horizontal	409336	3723124	3.66	4.60	533	18.0	0.127
All	S30	Horizontal	409353	3723112	3.66	4.60	533	18.0	0.127
All	S31	Horizontal	409283	3723189	3.66	4.60	533	18.0	0.127
All	S32	Horizontal	409299	3723177	3.66	4.60	533	18.0	0.127
All	S33	Horizontal	409316	3723166	3.66	4.60	533	18.0	0.127
All	S34	Horizontal	409332	3723154	3.66	4.60	533	18.0	0.127
All	S35	Horizontal	409349	3723142	3.66	4.60	533	18.0	0.127
All	S36	Horizontal	409366	3723131	3.66	4.60	533	18.0	0.127
All	S37	Horizontal	409331	3723044	3.66	4.60	533	18.0	0.127
All	S38	Horizontal	409344	3723063	3.66	4.60	533	18.0	0.127
All	S39	Horizontal	409357	3723082	3.66	4.60	533	18.0	0.127
All	S40	Horizontal	409373	3723070	3.66	4.60	533	18.0	0.127
All	S41	Horizontal	409370	3723101	3.66	4.60	533	18.0	0.127
All	S42	Horizontal	409386	3723089	3.66	4.60	533	18.0	0.127
All	S43	Horizontal	409403	3723077	3.66	4.60	533	18.0	0.127
All	S44	Horizontal	409382	3723119	3.66	4.60	533	18.0	0.127
All	S45	Horizontal	409399	3723108	3.66	4.60	533	18.0	0.127
All	S46	Horizontal	409415	3723096	3.66	4.60	533	18.0	0.127

Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)
FUGS	3.66	0.0	4.0	1.0	409199	3723086	409281	3723203	409449	3723089	409304	3723012

Huntington Beach Energy Project
Attachment DR104-4 Table 6
HBEP Operation with Demolition of Units 1 and 2 Modeling Parameters - Emission Rates
May 2013

Emission Rates for 1-hr, 3-hr, 8-hr, and 24-hr Modeling [a,b]

Source ID	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
	(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)
Stack 1	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 2	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 3	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 4	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 5	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
Stack 6	3.21	25.5	14.4	114	5.72	45.4	0.33	2.64	0.33	2.64	0.33	2.64	1.20	9.50	1.20	9.50
S(1-46)	0.59	4.64	0.76	6.04	0.76	6.04	1.59E-03	1.26E-02	1.59E-03	1.26E-02	6.63E-04	5.26E-03	0.012	0.099	0.012	0.099
FUGS	-	-	-	-	-	-	-	-	-	-	-	-	0.29	2.31	0.052	0.415
Maximum Month	80		80		80		80		80		80		80		80	

Emission Rates for Annual Modeling [a,b]

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
Stack 1	1.16	9.22	0.48	3.78	0.48	3.78
Stack 2	1.16	9.22	0.48	3.78	0.48	3.78
Stack 3	1.16	9.22	0.48	3.78	0.48	3.78
Stack 4	1.16	9.22	0.48	3.78	0.48	3.78
Stack 5	1.16	9.22	0.48	3.78	0.48	3.78
Stack 6	1.16	9.22	0.48	3.78	0.48	3.78
S(1-46)	0.15	1.19	0.007	0.058	0.007	0.058
FUGS	-	-	0.15	1.19	0.024	0.19
Maximum Months	78-89		77-88		77-88	

[a] Emission rates for construction exhaust point sources, S(1-46) source group, are presented as the sum total for all sources in the group.

[b] Short term Block 1 operation emissions were obtained from AFC Table 5.1-24, submitted June 2012. Annual Block 1 operation emissions were obtained from DR12, submitted November 2012. Block 2 construction emissions were obtained from Table 5.1A.46R from Appendix 5.1AR, submitted on February 22, 2013 as Attachment DR75-1 to Data Responses, Set 2A.

Huntington Beach Energy Project
Attachment DR104-4 Table 7
HBEP Operation with Demolition of Units 1 and 2 Building Parameters for AERMOD Input
May 2013

Building Name	Number of Tiers	Tier Number	Base Elevation (m)	Tier Height (m)	Number of Corners	Corner 1 East (X) (m)	Corner 1 North (Y) (m)	Corner 2 East (X) (m)	Corner 2 North (Y) (m)	Corner 3 East (X) (m)	Corner 3 North (Y) (m)
Admin	2	1	3.66	3.35	16	409290	3723286	409355	3723240	409351	3723235
Admin	*	2	*	5.18	14	409287	3723281	409348	3723237	409338	3723223
STG2	1	1	3.66	12.19	4	409165	3723276	409180	3723266	409170	3723252
ACC2	1	1	3.66	31.70	4	409212	3723305	409263	3723269	409241	3723237
ACC1	1	1	3.66	31.70	4	409474	3723311	409536	3723311	409537	3723274
STG1	1	1	3.66	12.19	4	409538	3723247	409556	3723247	409556	3723231
CTG4	1	1	3.66	28.04	4	409500	3723162	409517	3723162	409517	3723149
CTG5	1	1	3.66	28.04	4	409500	3723198	409517	3723198	409517	3723186
CTG6	1	1	3.66	28.04	4	409499	3723236	409517	3723236	409517	3723223
CTG1	1	1	3.66	28.04	4	409166	3723235	409176	3723252	409188	3723244
CTG2	1	1	3.66	28.04	4	409197	3723216	409207	3723232	409219	3723224
CTG3	1	1	3.66	28.04	4	409226	3723194	409236	3723210	409247	3723203
AIRIN6	1	1	3.66	11.61	6	409470	3723211	409470	3723215	409475	3723225
AIRIN5	1	1	3.66	11.61	6	409471	3723174	409471	3723178	409476	3723188
AIRIN4	1	1	3.66	11.61	6	409471	3723136	409471	3723141	409476	3723151
AIRIN1	1	1	3.66	11.61	6	409172	3723196	409169	3723199	409163	3723209
AIRIN2	1	1	3.66	11.61	6	409202	3723175	409199	3723178	409194	3723188
AIRIN3	1	1	3.66	11.61	6	409232	3723154	409229	3723157	409224	3723167

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Building Name	Corner 4 East (X) (m)	Corner 4 North (Y) (m)	Corner 5 East (X) (m)	Corner 5 North (Y) (m)	Corner 6 East (X) (m)	Corner 6 North (Y) (m)	Corner 7 East (X) (m)	Corner 7 North (Y) (m)	Corner 8 East (X) (m)	Corner 8 North (Y) (m)	Corner 9 East (X) (m)	Corner 9 North (Y) (m)	Corner 10 East (X) (m)
Admin	409348	3723237	409338	3723223	409343	3723219	409333	3723205	409321	3723213	409323	3723216	409296
Admin	409343	3723219	409333	3723205	409321	3723213	409323	3723216	409296	3723237	409296	3723237	409292
STG2	409156	3723262											
ACC2	409189	3723274											
ACC1	409474	3723274											
STG1	409538	3723231											
CTG4	409500	3723150											
CTG5	409500	3723186											
CTG6	409499	3723224											
CTG1	409178	3723228											
CTG2	409209	3723208											
CTG3	409237	3723187											
AIRIN6	409477	3723225	409482	3723215	409482	3723210							
AIRIN5	409478	3723188	409483	3723178	409483	3723174							
AIRIN4	409478	3723151	409483	3723140	409483	3723136							
AIRIN1	409164	3723211	409176	3723208	409179	3723206							
AIRIN2	409195	3723190	409206	3723187	409209	3723185							
AIRIN3	409225	3723169	409236	3723166	409239	3723164							

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Building Name	Corner 10 North (Y) (m)	Corner 11 East (X) (m)	Corner 11 North (Y) (m)	Corner 12 East (X) (m)	Corner 12 North (Y) (m)	Corner 13 East (X) (m)	Corner 13 North (Y) (m)	Corner 14 East (X) (m)	Corner 14 North (Y) (m)	Corner 15 East (X) (m)	Corner 15 North (Y) (m)	Corner 16 East (X) (m)	Corner 16 North (Y) (m)
Admin	3723237	409296	3723237	409292	3723241	409293	3723243	409279	3723252	409292	3723270	409283	3723276
Admin	3723241	409293	3723243	409279	3723252	409292	3723270	409283	3723276				
STG2													
ACC2													
ACC1													
STG1													
CTG4													
CTG5													
CTG6													
CTG1													
CTG2													
CTG3													
AIRIN6													
AIRIN5													
AIRIN4													
AIRIN1													
AIRIN2													
AIRIN3													

Huntington Beach Energy Project
Attachment DR104-4 Table 8
HBEP Operation with Demolition of Units 1 and 2 Modeling Results
May 2013

Source	Year	NO_2 ($\mu g/m^3$) [a]		CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
		1-hr	Annual	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
ALL		65.3	4.18	148	79.5	2.63	1.62	1.04	257	34.5	48.0	5.93
CONSTRUCTION	2005	65.2	3.58	106	79.4	0.22	0.20	0.051	256	34.1	46.4	5.57
OPERATION		21.4	1.39	120	25.1	2.60	1.61	1.04	3.77	0.81	3.77	0.81
ALL		63.3	4.18	176	77.3	1.90	1.45	1.05	241	34.3	45.1	5.89
CONSTRUCTION	2006	63.3	3.60	103	77.3	0.22	0.20	0.051	239	34.0	43.4	5.55
OPERATION		29.9	1.36	167	24.6	1.90	1.42	1.05	3.79	0.79	3.79	0.79
ALL		63.2	3.92	125	92.5	2.09	1.58	1.04	208	35.4	38.5	5.97
CONSTRUCTION	2007	63.1	3.52	103	92.4	0.21	0.20	0.054	207	35.2	37.8	5.74
OPERATION		21.8	0.99	122	29.7	2.08	1.57	1.03	3.74	0.59	3.74	0.59
ALL		64.4	3.71	131	79.2	1.77	1.47	0.61	196	36.3	35.8	6.02
CONSTRUCTION	2008	64.4	3.50	105	79.0	0.22	0.20	0.044	196	36.2	35.5	5.89
OPERATION		23.1	0.66	129	23.5	1.76	1.47	0.61	2.24	0.41	2.24	0.41
ALL		66.1	4.21	160	76.5	2.77	1.51	0.99	248	43.3	46.1	7.25
CONSTRUCTION	2009	66.1	3.76	108	76.0	0.22	0.20	0.049	247	43.0	44.8	6.98
OPERATION		24.2	1.07	135	24.4	2.76	1.50	0.99	3.57	0.64	3.57	0.64

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

Huntington Beach Energy Project
Attachment DR104-4 Table 9
HBEP Construction and Demolition of Units 3 and 4 Source Parameters for AERMOD Input
May 2013

Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
E01	Horizontal	409329	3723184	3.66	4.60	533	18.0	0.127
E02	Horizontal	409345	3723173	3.66	4.60	533	18.0	0.127
E03	Horizontal	409362	3723161	3.66	4.60	533	18.0	0.127
E04	Horizontal	409378	3723150	3.66	4.60	533	18.0	0.127
E05	Horizontal	409341	3723203	3.66	4.60	533	18.0	0.127
E06	Horizontal	409358	3723191	3.66	4.60	533	18.0	0.127
E07	Horizontal	409374	3723180	3.66	4.60	533	18.0	0.127
E08	Horizontal	409391	3723168	3.66	4.60	533	18.0	0.127
E09	Horizontal	409354	3723222	3.66	4.60	533	18.0	0.127
E10	Horizontal	409371	3723210	3.66	4.60	533	18.0	0.127
E11	Horizontal	409387	3723199	3.66	4.60	533	18.0	0.127
E12	Horizontal	409404	3723187	3.66	4.60	533	18.0	0.127
E13	Horizontal	409395	3723138	3.66	4.60	533	18.0	0.127
E14	Horizontal	409412	3723126	3.66	4.60	533	18.0	0.127
E15	Horizontal	409428	3723115	3.66	4.60	533	18.0	0.127
E16	Horizontal	409445	3723103	3.66	4.60	533	18.0	0.127
E17	Horizontal	409408	3723157	3.66	4.60	533	18.0	0.127
E18	Horizontal	409424	3723145	3.66	4.60	533	18.0	0.127
E19	Horizontal	409441	3723133	3.66	4.60	533	18.0	0.127
E20	Horizontal	409457	3723122	3.66	4.60	533	18.0	0.127
E21	Horizontal	409420	3723175	3.66	4.60	533	18.0	0.127
E22	Horizontal	409437	3723164	3.66	4.60	533	18.0	0.127
E23	Horizontal	409454	3723152	3.66	4.60	533	18.0	0.127
E24	Horizontal	409470	3723141	3.66	4.60	533	18.0	0.127
E25	Horizontal	409487	3723129	3.66	4.60	533	18.0	0.127
E26	Horizontal	409469	3723294	3.66	4.60	533	18.0	0.127
E27	Horizontal	409469	3723276	3.66	4.60	533	18.0	0.127
E28	Horizontal	409469	3723257	3.66	4.60	533	18.0	0.127
E29	Horizontal	409469	3723239	3.66	4.60	533	18.0	0.127
E30	Horizontal	409469	3723221	3.66	4.60	533	18.0	0.127
E31	Horizontal	409469	3723202	3.66	4.60	533	18.0	0.127
E32	Horizontal	409469	3723184	3.66	4.60	533	18.0	0.127
E33	Horizontal	409469	3723166	3.66	4.60	533	18.0	0.127
E34	Horizontal	409488	3723294	3.66	4.60	533	18.0	0.127
E35	Horizontal	409488	3723276	3.66	4.60	533	18.0	0.127
E36	Horizontal	409488	3723257	3.66	4.60	533	18.0	0.127
E37	Horizontal	409488	3723239	3.66	4.60	533	18.0	0.127
E38	Horizontal	409489	3723221	3.66	4.60	533	18.0	0.127
E39	Horizontal	409489	3723203	3.66	4.60	533	18.0	0.127
E40	Horizontal	409489	3723184	3.66	4.60	533	18.0	0.127
E41	Horizontal	409489	3723166	3.66	4.60	533	18.0	0.127
E42	Horizontal	409489	3723148	3.66	4.60	533	18.0	0.127
E43	Horizontal	409508	3723294	3.66	4.60	533	18.0	0.127
E44	Horizontal	409508	3723276	3.66	4.60	533	18.0	0.127
E45	Horizontal	409508	3723258	3.66	4.60	533	18.0	0.127
E46	Horizontal	409508	3723239	3.66	4.60	533	18.0	0.127
E47	Horizontal	409508	3723221	3.66	4.60	533	18.0	0.127
E48	Horizontal	409508	3723203	3.66	4.60	533	18.0	0.127
E49	Horizontal	409508	3723184	3.66	4.60	533	18.0	0.127
E50	Horizontal	409508	3723166	3.66	4.60	533	18.0	0.127
E51	Horizontal	409508	3723148	3.66	4.60	533	18.0	0.127
E52	Horizontal	409527	3723294	3.66	4.60	533	18.0	0.127
E53	Horizontal	409527	3723276	3.66	4.60	533	18.0	0.127
E54	Horizontal	409527	3723258	3.66	4.60	533	18.0	0.127
E55	Horizontal	409527	3723239	3.66	4.60	533	18.0	0.127
E56	Horizontal	409528	3723221	3.66	4.60	533	18.0	0.127
E57	Horizontal	409528	3723203	3.66	4.60	533	18.0	0.127
E58	Horizontal	409528	3723185	3.66	4.60	533	18.0	0.127
E59	Horizontal	409528	3723166	3.66	4.60	533	18.0	0.13
E60	Horizontal	409528	3723148	3.66	4.60	533	18.0	0.13
E61	Horizontal	409547	3723295	3.66	4.60	533	18.0	0.13
E62	Horizontal	409547	3723276	3.66	4.60	533	18.0	0.13
E63	Horizontal	409547	3723258	3.66	4.60	533	18.0	0.13
E64	Horizontal	409547	3723240	3.66	4.60	533	18.0	0.13
E65	Horizontal	409547	3723221	3.66	4.60	533	18.0	0.13
E66	Horizontal	409547	3723203	3.66	4.60	533	18.0	0.13
E67	Horizontal	409547	3723185	3.66	4.60	533	18.0	0.13
E68	Horizontal	409547	3723166	3.66	4.60	533	18.0	0.13
E69	Horizontal	409547	3723148	3.66	4.60	533	18.0	0.13
E70	Horizontal	409509	3723130	3.66	4.60	533	18.0	0.13
W01	Horizontal	409086	3723188	3.66	4.60	533	18.0	0.127
W02	Horizontal	409103	3723177	3.66	4.60	533	18.0	0.127
W03	Horizontal	409120	3723165	3.66	4.60	533	18.0	0.127
W04	Horizontal	409136	3723153	3.66	4.60	533	18.0	0.127
W05	Horizontal	409153	3723142	3.66	4.60	533	18.0	0.127
W06	Horizontal	409169	3723130	3.66	4.60	533	18.0	0.127
W07	Horizontal	409186	3723119	3.66	4.60	533	18.0	0.127
W08	Horizontal	409203	3723107	3.66	4.60	533	18.0	0.127
W09	Horizontal	409099	3723207	3.66	4.60	533	18.0	0.127
W10	Horizontal	409116	3723195	3.66	4.60	533	18.0	0.127
W11	Horizontal	409132	3723184	3.66	4.60	533	18.0	0.127
W12	Horizontal	409149	3723172	3.66	4.60	533	18.0	0.127
W13	Horizontal	409165	3723160	3.66	4.60	533	18.0	0.127
W14	Horizontal	409182	3723149	3.66	4.60	533	18.0	0.127
W15	Horizontal	409199	3723137	3.66	4.60	533	18.0	0.127
W16	Horizontal	409215	3723126	3.66	4.60	533	18.0	0.127
W17	Horizontal	409112	3723226	3.66	4.60	533	18.0	0.127
W18	Horizontal	409128	3723214	3.66	4.60	533	18.0	0.127
W19	Horizontal	409145	3723202	3.66	4.60	533	18.0	0.127
W20	Horizontal	409162	3723191	3.66	4.60	533	18.0	0.127
W21	Horizontal	409178	3723179	3.66	4.60	533	18.0	0.127
W22	Horizontal	409195	3723168	3.66	4.60	533	18.0	0.127

Huntington Beach Energy Project
Attachment DR104-4 Table 9
HBEP Construction and Demolition of Units 3 and 4 Source Parameters for AERMOD Input
May 2013

Point Sources

Source ID	Stack Release Type (Beta)	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
W23	Horizontal	409211	3723156	3.66	4.60	533	18.0	0.127
W24	Horizontal	409228	3723144	3.66	4.60	533	18.0	0.127
W25	Horizontal	409124	3723244	3.66	4.60	533	18.0	0.127
W26	Horizontal	409141	3723233	3.66	4.60	533	18.0	0.127
W27	Horizontal	409158	3723221	3.66	4.60	533	18.0	0.127
W28	Horizontal	409174	3723209	3.66	4.60	533	18.0	0.127
W29	Horizontal	409191	3723198	3.66	4.60	533	18.0	0.127
W30	Horizontal	409207	3723186	3.66	4.60	533	18.0	0.127
W31	Horizontal	409224	3723175	3.66	4.60	533	18.0	0.127
W32	Horizontal	409241	3723163	3.66	4.60	533	18.0	0.127
W33	Horizontal	409137	3723263	3.66	4.60	533	18.0	0.127
W34	Horizontal	409154	3723251	3.66	4.60	533	18.0	0.127
W35	Horizontal	409170	3723240	3.66	4.60	533	18.0	0.127
W36	Horizontal	409187	3723228	3.66	4.60	533	18.0	0.127
W37	Horizontal	409204	3723217	3.66	4.60	533	18.0	0.127
W38	Horizontal	409220	3723205	3.66	4.60	533	18.0	0.127
W39	Horizontal	409237	3723193	3.66	4.60	533	18.0	0.127
W40	Horizontal	409253	3723182	3.66	4.60	533	18.0	0.127
W41	Horizontal	409150	3723282	3.66	4.60	533	18.0	0.127
W42	Horizontal	409166	3723270	3.66	4.60	533	18.0	0.127
W43	Horizontal	409183	3723258	3.66	4.60	533	18.0	0.127
W44	Horizontal	409200	3723247	3.66	4.60	533	18.0	0.127
W45	Horizontal	409216	3723235	3.66	4.60	533	18.0	0.127
W46	Horizontal	409233	3723224	3.66	4.60	533	18.0	0.127
W47	Horizontal	409249	3723212	3.66	4.60	533	18.0	0.127
W48	Horizontal	409266	3723200	3.66	4.60	533	18.0	0.127
W49	Horizontal	409163	3723300	3.66	4.60	533	18.0	0.127
W50	Horizontal	409179	3723289	3.66	4.60	533	18.0	0.127
W51	Horizontal	409196	3723277	3.66	4.60	533	18.0	0.127
W52	Horizontal	409212	3723266	3.66	4.60	533	18.0	0.127
W53	Horizontal	409229	3723254	3.66	4.60	533	18.0	0.127
W54	Horizontal	409246	3723242	3.66	4.60	533	18.0	0.127
W55	Horizontal	409262	3723231	3.66	4.60	533	18.0	0.127
W56	Horizontal	409279	3723219	3.66	4.60	533	18.0	0.127
W57	Horizontal	409175	3723319	3.66	4.60	533	18.0	0.127
W58	Horizontal	409192	3723307	3.66	4.60	533	18.0	0.127
W59	Horizontal	409208	3723296	3.66	4.60	533	18.0	0.127
W60	Horizontal	409225	3723284	3.66	4.60	533	18.0	0.127
W61	Horizontal	409242	3723273	3.66	4.60	533	18.0	0.127
W62	Horizontal	409258	3723261	3.66	4.60	533	18.0	0.127
W63	Horizontal	409275	3723249	3.66	4.60	533	18.0	0.127
W64	Horizontal	409291	3723238	3.66	4.60	533	18.0	0.127
W65	Horizontal	409188	3723338	3.66	4.60	533	18.0	0.127
W66	Horizontal	409205	3723326	3.66	4.60	533	18.0	0.127
W67	Horizontal	409221	3723315	3.66	4.60	533	18.0	0.127
W68	Horizontal	409238	3723303	3.66	4.60	533	18.0	0.127
W69	Horizontal	409254	3723291	3.66	4.60	533	18.0	0.127
W70	Horizontal	409271	3723280	3.66	4.60	533	18.0	0.127
W71	Horizontal	409288	3723268	3.66	4.60	533	18.0	0.127
W72	Horizontal	409304	3723257	3.66	4.60	533	18.0	0.127

Area Sources

Source ID	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North	Vertical Dimension (m)
FUGW	409066	3723183	3.7	0.0	165	215	35	1.0

Area Poly Sources

Source ID	Base Elevation (m)	Release Height (m)	Number of Vertices	Vertical Dimension (m)	Easting (X1) (m)	Northing (Y1) (m)	Easting (X2) (m)	Northing (Y2) (m)	Easting (X3) (m)	Northing (Y3) (m)	Easting (X4) (m)	Northing (Y4) (m)
	3.66	0.0	9.0	1.0	409452	3723309	409563	3723310	409565	3723115	409537	3723136

	Easting (X5) (m)	Northing (Y5) (m)	Easting (X6) (m)	Northing (Y6) (m)	Easting (X7) (m)	Northing (Y7) (m)	Easting (X8) (m)	Northing (Y8) (m)	Easting (X9) (m)	Northing (Y9) (m)
FUGE	409449.06	3723088.78	409315.11	3723180.26	409358.4	3723244.58	409372	3723242	409453	3723187

Huntington Beach Energy Project
Attachment DR104-4 Table 10
HBEP Construction and Demolition of Units 3 and 4 Modeling Parameters - Emission Rates
May 2013

Emission Rates for 1-hr, 3-hr, 8-hr, and 24-hr Modeling [a,b]

Source ID	1-hr NO_2		1-hr CO		8-hr CO		1-hr SO_2		3-hr SO_2		24-hr SO_2		24-hr PM_{10}		24-hr $PM_{2.5}$	
	(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)
E(1-70)	0.82	6.47	0.20	1.55	0.20	1.55	5.36E-04	4.25E-03	5.36E-04	4.25E-03	2.23E-04	1.77E-03	0.023	0.18	0.023	0.179
FUGE	-	-	-	-	-	-	-	-	-	-	-	-	0.34	2.70	0.074	0.59
W(1-72)	0.49	3.86	0.83	6.56	0.83	6.56	1.78E-03	1.41E-02	1.78E-03	1.41E-02	7.42E-04	5.89E-03	0.004	0.033	0.004	0.032
FUGW	-	-	-	-	-	-	-	-	-	-	-	-	0.071	0.565	0.010	0.076
Maximum Month	19		36		36		36		36		36		16		16	

Emission Rates for Annual Modeling [a,b]

Source ID	Annual NO_2		Annual PM_{10}		Annual $PM_{2.5}$	
	(g/s)	(lb/hr)	(g/s)	(lb/hr)	(g/s)	(lb/hr)
W(1-72)	0.18	1.46	0.014	0.11	0.013	0.10
FUGW	-	-	0.11	0.87	0.020	0.16
W(1-72)	0.19	1.47	0.0051	0.041	0.0069	0.054
FUGW	-	-	0.055	0.44	0.0075	0.060
Maximum Months	18-29		10-21		13-24	

[a] Emission rates for construction exhaust point sources, W(1-72) and E(1-70) source groups, are presented as the sum total for all sources in each respective group.

[b] Units 3 and 4 demolition emissions, as well as construction emissions that overlap in time with the demolition of Units 3 and 4, were obtained from Table 5.1A.58 of Attachment WSQ2-3.

Huntington Beach Energy Project
Attachment DR104-4 Table 11
HBEP Construction and Demolition of Units 3 and 4 Modeling Results
May 2013

Source	Year	NO_2 ($\mu g/m^3$)			CO ($\mu g/m^3$)		SO_2 ($\mu g/m^3$)			PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
		1-hr [a]	Federal 1-hr [b]	Annual [a]	1-hr	8-hr	1-hr	3-hr	24-hr	24-hr	Annual	24-hr	Annual
ALL	2005	90.6	135	7.62	105	79.6	0.23	0.20	0.051	289	64.5	63.6	11.98
CONSTRUCTION		74.1	74.1	5.19	22.2	16.2	0.061	0.057	0.015	286	62.9	63.2	11.66
DEMOLITION		46.4	46.4	4.65	98.6	75.4	0.21	0.19	0.049	53.0	16.2	7.31	2.42
ALL	2006	90.7	137	7.66	104	76.9	0.23	0.21	0.050	290	65.3	64.1	12.12
CONSTRUCTION		74.7	74.7	5.12	22	17.5	0.061	0.055	0.013	289	63.5	64.0	11.78
DEMOLITION		46.6	46.6	4.75	99.0	74.3	0.21	0.21	0.048	50.0	16.2	6.87	2.42
ALL	2007	91.0	139	7.40	102	92.1	0.22	0.21	0.056	278	59.3	61.5	11.02
CONSTRUCTION		76.2	76.2	4.75	22.9	18.1	0.063	0.057	0.013	278	57.6	61.4	10.69
DEMOLITION		46.0	46.0	4.55	97.8	84.1	0.21	0.19	0.050	46.2	15.6	6.38	2.33
ALL	2008	91.2	138	7.34	103	75.4	0.23	0.20	0.048	239	53.7	52.7	9.98
CONSTRUCTION		75.8	75.8	4.79	22.8	16.5	0.062	0.059	0.013	236	51.8	52.2	9.62
DEMOLITION		46.3	46.3	4.69	98.3	69.8	0.21	0.19	0.045	37.5	16.1	5.24	2.40
ALL	2009	91.2	138	7.61	105	73.8	0.23	0.21	0.050	261	58.0	57.7	10.76
CONSTRUCTION		75.0	75.0	4.94	22.5	15.2	0.062	0.057	0.014	260	55.7	57.5	10.34
DEMOLITION		46.3	46.3	4.70	98.4	69.2	0.21	0.19	0.048	42.3	16.9	5.86	2.52

[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 maximum modeled concentration paired with the three-year average of 98th percentile seasonal hourly background concentrations, as provided by the SCAQMD.