Nuclear Development
244 Chestnut Street, Salem, NJ 08079

PSEG
Power LLC

ND-2014-0007
February 27, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: **PSEG Early Site Permit Application**
Docket No. 52-043
Response to Request for Additional Information, No. Env-08S,
ESP EIS 2.9 - Meteorology and Air Quality

References: 1) PSEG Power, LLC Letter No. ND-2013-0006 to USNRC, Submittal of Revision 2 of the Early Site Permit Application for the PSEG Site, dated March 27, 2013

2) Env-08S, Review Section: ESP EIS 2.9 – Meteorology and Air Quality, dated January 30, 2014 (eRAI 7369)

The purpose of this letter is to respond to the request for additional information (RAI) identified in Reference 2 above. This RAI addresses Question Nos. ESP EIS 2.9-2 and 2.9-3 for the Environmental Report (ER), as submitted in Part 3 of the PSEG Site Early Site Permit Application, Revision 2.

Enclosure 1 provides our response for RAI No. Env-08S, Question Nos. ESP EIS 2.9-2 and 2.9-3. There are no changes to the ER resulting from our responses to these questions.

Enclosure 2 provides the electronic files requested for docketing in RAI No. Env-08S.

If any additional information is needed, please contact David Robillard, PSEG Nuclear Development Licensing Engineer, at (856) 339-7914.

D079
LIRO

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 27th day of February, 2014.

Sincerely,

James Mallon
Early Site Permit Manager
Nuclear Development
PSEG Power, LLC

Enclosure 1: Response to NRC Request for Additional Information, RAI No. Env-08S, Question Nos. ESP EIS 2.9-2 and 2.9-3, Review Section: ESP EIS 2.9 - Meteorology and Air Quality
Enclosure 2: CD-ROM Containing Files Requested for Docketing in RAI No. Env-08S

cc: USNRC Project Manager, Division of New Reactor Licensing, PSEG Site (w/enclosures)
USNRC Environmental Project Manager, Division of New Reactor Licensing (w/enclosures)
USNRC Region I, Regional Administrator (w/Enclosure 1)
Argonne National Laboratory (w/enclosures)
Oak Ridge National Laboratory (w/enclosures)
USACE, Philadelphia District (w/Enclosure 1)

PSEG Letter ND-2014-0007, dated February 27, 2014

ENCLOSURE 1

RESPONSE to RAI No. Env-08S

QUESTION Nos.
ESP EIS 2.9-2
ESP EIS 2.9-3

Response to RAI No. Env-08S, Question ESP EIS 2.9-2 (rMET-09SA)

In question ESP EIS 2.9-2 the NRC staff asked PSEG to provide a detailed estimation of ozone precursor pollutants (NOx and VOC) and $PM_{2.5}$, as applicable, consistent with activities for which permits from the United States Army Corps of Engineers (USACE), Philadelphia District will be required at the PSEG Site for use in a general conformity determination. The specific request was:

rMET-09SA (Corps): Provide estimates of ozone precursor (NOx and VOC) emissions and PM2.5, consistent with the level of detail known at the Early Site Permit (ESP) stage of the project, associated with activities for which permits from the Army Corps of Engineers (USACE), Philadelphia District will be required at the PSEG Site for use in a general conformity determination.*

Supporting Information: 40 CFR 81.331 lists Salem County as a nonattainment area for the 2008 8-hour ozone NAAQS. New Castle County, Delaware, located near the PSEG Site, is in nonattainment for the PM2.5 NAAQS (40 CFR 81.308). 40 CFR Part 93 Subpart B requires a Federal agency to make a determination that a Federal action conforms to the applicable implementation plan in a nonattainment or maintenance area. Provide the appropriate information to address the cited regulatory programs in New Jersey and if applicable, Delaware.

Emission estimates are the basis for the general conformity determination. Provide estimates of ozone precursor (NOx and VOC) emissions and PM2.5 direct emissions and precursor (SO2, NOx, VOC or ammonia) emissions associated with activities for which permits from the USACE, Philadelphia District, will be required at the PSEG Site for the purpose of supporting the general conformity determination. These estimates should be consistent with the level of detail available at the ESP stage of the project and the Plant Parameter Envelope approach, recognizing that a specific reactor technology has not been selected. The basis for the estimates, to the degree that they currently cannot be quantified, should be assessed against Best Management Practices and assumptions for such items as equipment, fuel constituents, and emission factors, and include any future actions necessary to address estimated emissions.

Major site preparation activities proposed by PSEG are expected to include dredge and fill operations associated with building of a causeway, dredging and construction of intake/outfall structures, and other fill as regulated by the USACE.

**RAI issued on behalf the US Army Corps of Engineers, Philadelphia District.*

PSEG Response to NRC RAI ESP EIS 2.9-2 (rMET-09SA)

PSEG Power, LLC and PSEG Nuclear, LLC submitted an Early Site Permit application (ESPA) to the United States Nuclear Regulatory Commission (USNRC) for the potential development of a new plant at the PSEG Site. As part of the proposed project, major site preparation activities proposed by PSEG are expected to include fill operations associated with building of a new site access causeway, dredging and construction of intake/outfall structures and barge facilities for the new plant, wetlands mitigation, and other fill as regulated by the United States Army Corp of Engineers (USACE). As part of this ESPA process, it is necessary to develop an Air Conformity Analysis to address the anticipated scope of the construction activities (as outlined above for USACE-regulated scope) for the air emissions from the related activities that are subject to review as part of the USACE permitting process. The overall construction of this facility is expected to occur over an approximate seven year period. Fill activities are expected to occur within the first five years with dredging activities occurring within the first three years. Construction activities associated with wetland mitigation are expected to occur in the first two years.

The requirement for a Conformity Analysis stems from the General Conformity Rule (40 CFR Part 93, Subpart B - Determining Conformity of General Federal Actions to State or Federal Implementation Plans). This rule ensures that the actions taken by federal agencies in nonattainment areas do not interfere with a state's plans to meet National Ambient Air Quality Standards (NAAQS). Under the General Conformity Rule, federal agencies authorizing this project are required to demonstrate conformity for any pollutant designated as nonattainment in the area where the emissions originate.

The PSEG Site is located on Artificial Island, in Salem County, New Jersey (NJ). This location (Salem County) is classified as in attainment for all criteria pollutants, with the exception of ozone. The border of New Castle County, Delaware (DE) is approximately three-quarters of a mile to the north and west of the project location. New Castle County is currently designated as a nonattainment area for $PM_{2.5}$. Under the scope of a conformity analysis, the rule specifically states that only emissions that "originate in a nonattainment or maintenance area", are to be analyzed. It is anticipated that construction equipment use, construction vehicle traffic, most commuting traffic, and site construction and dredging for this project, will originate outside the borders of the DE nonattainment area. For this reason, under the General Conformity Rule (citation above), $PM_{2.5}$ is not required to be included within the scope of this conformity analysis. However, due to a portion of the workforce commuting from New Castle County, DE, the analysis includes emissions of $PM_{2.5}$, as well as oxides of nitrogen (NOx) and volatile organic compounds (VOCs), from commuter vehicles in DE.

For ozone, Salem County is designated as a "moderate nonattainment" area. The formation of ground-level ozone results from complex chemical reactions between VOCs and NOx in the presence of sunlight, and not by direct emissions. For demonstration of conformity with regard to ozone nonattainment, PSEG must demonstrate *de minimis* emission levels of NOx and VOCs resulting from construction-related activities at the site. For NOx and $PM_{2.5}$, the *de minimis* emission level is 100 tons per year (TPY), while VOCs are limited to 50 TPY.

This response provides documentation of the various emission sources associated with the construction-related activities subject to USACE jurisdiction. It also provides specific information (to the degree construction plans / data currently exist for the project) regarding the equipment types that are expected to be used, the source of the emission factors used, and the emission estimation methodology. These estimates are consistent with the level of detail available at the ESPA stage of the project and the Plant Parameter Envelope (PPE) approach, recognizing that a reactor technology has not been selected, a construction contractor has not been selected, and a specific construction plan has not been developed. These emissions estimates use reasonable and conservative values to predict emissions of NOx and VOCs from the construction site for conformity determination, as well as DE commuting traffic emissions for $PM_{2.5}$.

Construction Emission Estimation Methodology

This section details the main phases of the construction activities within the scope of this conformity analysis: marine dredging activities associated with the new plant barge facilities and intake areas; dredging and fill activities associated with the wetlands mitigation component of the project; causeway construction-related wetlands fill; and site construction fill movement, grading, and placement for construction of the general site, intake, barge mooring, and outfall structures. The following sections provide emission estimate details for marine dredging and fill activities, PSEG Site construction and the associated wetlands mitigation activities. Detailed emission calculations and assumptions are provided in Tables ESP EIS 2.9-2-1 through ESP EIS 2.9-2-8.

The analysis is based on an assumed seven year overall construction period. Site preparation activities are assumed to be initiated in 2015, with NRC regulated construction starting in 2016. Dredging-related activities are assumed to occur in the first three years, wetland mitigation activities are assumed to occur in the first two years, and fill activities including all fill deliveries are assumed to occur in the first five years. Commuting traffic is assumed to continue for all seven years of the overall construction period in order to address potential schedule delays for dredging, wetlands mitigation, or fill beyond their respective assumed two to five year windows.

Marine Dredging Activities

The ESPA provides the current estimation of the amount of dredging necessary during the three year dredging period, which includes 225,000 cubic yards (cu. yd.) for the intake areas / structures, and an additional 440,000 cu. yd. for construction of a barge facility (for supply deliveries during plant construction). The estimation assumes that concurrent with the dredging operation, a small survey boat will accompany the operation, as well as two tugs for barge manipulation.

The emissions estimation conservatively assumes that dredging engines similar to the large dredging equipment evaluated by the USACE in the *Delaware River Main Channel Deepening Project General Conformity Analysis* (Reference RAI ESP EIS 2.9-2-1) will be used at the PSEG Site. The analysis also assumes that a locomotive-style engine with a maximum rating of 12,310 horsepower (HP) will be used as the primary dredging engine. The dredging capacity for such an engine (Reference RAI ESP EIS 2.9-2-2) is approximately 21 cu. yd. per installed HP-month.

For the purposes of this analysis, it is anticipated that a barge with the dredging capacity factor of approximately 21 cu. yd. per installed HP-month, would dredge approximately 250,000 cu. yd. of material per month. Conservatively, it is assumed that a dredge of the specified size will be required for a two month period (eight weeks) for each of the three years of dredging activity in order to complete the 665,000 cu. yd. of material dredging. Two months per year is selected based on dredging windows that are typically allowable under natural resource protection provisions of the various resource agencies. The analysis further assumes that during each of the two month annual dredging periods, the dredge and support boats / barges will be in operation for 60 hours / week. This amount of potential dredging activity envelopes the project with considerable margin, since the dredging activity is the major source for NOx within this analysis. As stated above, if three years of dredging actually occurred for two months / year, with equipment as specified above, the equivalent dredge material quantity would be approximately 1.5 million cu. yd. The large margin is included to account for potential changes to the dredging equipment in the future. Emissions estimates for VOCs and NOx are based upon locomotive-type engine factors provided by the United States Environmental Protection Agency (EPA) (Reference RAI ESP EIS 2.9-2-2).

Causeway Construction and Overall Site Fill Activities

Construction of a new site access causeway, general site fill, and construction of intake and discharge structures requires movement of a significant amount (three million cu. yd.) of fill material. In order to envelope this process, the analysis

assumes that 100 per cent of this material will be brought to the PSEG Site via on-road means from existing borrow pits during the first five years of the overall construction window.

Primary (direct) emissions of NOx and VOCs during the construction of the causeway, intake / discharge structures, barge facilities, wetland mitigation, and site filling activities results from the fuel combustion of the earthmoving, dredging, and ancillary construction equipment at the site. Secondary (indirect) emissions of these pollutants (and $PM_{2.5}$ for commuters from DE) will be generated by the commuting of the workers and the hauling of fill to the site via on-road vehicles.

Emissions estimation for the site construction equipment was conducted using factors from the EPA NONROAD2008 model, as detailed in the spark-engine and compression-engine exhaust emission factor documents (References RAI ESP EIS 2.9-2-3 and RAI ESP EIS 2.9-2-4, respectively). Calculations for emissions of NOx and VOCs from the non-road construction equipment, detailed documentation of the emission factor calculations, equipment counts, and assumed hours of operation per year are presented in Tables ESP EIS 2.9-2-3 through ESP EIS 2.9-2-5.

For estimation of primary emissions from on-site fill hauling vehicles, as well as the secondary emissions of NOx and VOCs, the EPA Mobile6.2 model was used (Reference RAI ESP EIS 2.9-2-5). Since a large over-the-road diesel tractor trailer can hold approximately 20 cu. yd. of material, an estimated 150,000 trailer trips are necessary for the completion of this project. It is assumed for deliveries to the PSEG Site that the maximum travel distance of a fill transport truck is 50 miles, with the average travel distance of 25 miles each way per load. This results in a total road mileage for these trucks of 7,500,000 miles over the five year period when fill activities are expected.

Emissions estimates for mobile sources from Mobile6.2 are based on a gram per mile basis, and vary based upon the specific calendar year to be calculated. As such, the period of emissions calculations used in Mobile6.2 calculations is assumed to be for calendar years 2015-2021. Secondary emissions of NOx and VOCs are similarly calculated for commuter traffic to the site and for delivery vehicles. $PM_{2.5}$ emissions are calculated for DE commuting traffic using the same methodology. These calculations (and assumptions) are detailed in Tables ESP EIS 2.9-2-6 through ESP EIS 2.9-2-8.

Wetland Mitigation

Guidelines for Section 404(b)(1) of the Clean Water Act require that actions proposed within "waters of the United States", that are not water-dependent, must demonstrate that all appropriate reasonable and prudent measures to avoid and minimize impacts have been considered. If all appropriate measures to avoid and

minimize wetland impacts have been considered and employed, to the extent practicable, and the action still results in unavoidable wetland impacts, a compensatory mitigation plan should be considered.

PSEG, through its Estuary Enhancement Program, has extensive experience and demonstrated success implementing coastal salt marsh and freshwater wetland restoration and rehabilitation programs. This experience has been applied in this analysis. A wetland mitigation site, Mason's Point, was identified during the ESPA development process that is expected to meet the wetland mitigation requirements of the new plant at the PSEG Site. Mason's Point is located in Elsinboro Township, NJ near Alloway Creek, 2.5-miles upstream from the creek's confluence with the Delaware River. The Mason's Point wetland mitigation site is completely located in New Jersey.

The Mason's Point site contains between 700 and 900 acres of restorable lands. The mitigation planning identified methods for restoration including diking, marsh creek dredging, flood protection for adjoining properties and other activities consistent with the experience gained by PSEG during the implementation of the Estuary Enhancement Program. Equipment that would be used in construction of the mitigation site includes small suction dredges, trackhoes, backhoes, other earthmoving equipment, and small boats. The requisite emissions calculations for NOx and VOCs from the equipment expected to be used during the assumed two years of Wetland Mitigation implementation are presented in Tables ESP EIS 2.9-2-3 through ESP EIS 2.9-2-5.

Conformity Analysis Results

As summarized below (and shown with more detail in Tables ESP EIS 2.9-2-1 and ESP EIS 2.9-2-2) the estimated emissions from this project are not expected to exceed the *de minimis* threshold for VOCs, $PM_{2.5}$ (in DE), or for NOx for any of the seven years of this analysis. The maximum predicted emissions for NOx for any given year are 76.41 tons in NJ and 0.10 tons in DE. The maximum emissions for VOCs are predicted to be 7.05 tons in NJ and 0.12 tons in DE. The maximum $PM_{2.5}$ emissions in DE are 0.08 tons / year. Excepting DE, these emissions are primarily driven by dredging-related activities, which are based on conservative assumptions. The results overstate the likely emissions, but are included in the analysis to provide a level of assurance that conformity thresholds are not exceeded.

Yearly Predicted Emissions for Conformity - NJ

Construction Emissions	NOx (tons)	VOC (tons)
Year 1	76.41	7.05
Year 2	73.99	6.31
Year 3	71.11	5.67
Year 4	12.87	3.63
Year 5	11.70	3.56
Year 6	0.93	1.08
Year 7	0.90	1.03

Delaware emissions are significantly lower, as they constitute commuting emissions only, including fugitive emissions. In all years analyzed, they do not exceed 0.12 tons of NOx, VOCs, or $PM_{2.5}$. Given the extremely low $PM_{2.5}$ emissions in DE, precursor emissions (ammonia and sulfur dioxide) were not calculated as they are negligible.

The analysis includes emissions for commuting, light vehicle and miscellaneous equipment (i.e., generators, etc.) for NJ and DE, for all years of the project, as detailed in the Tables.

This analysis utilizes reasonable and conservative estimates, especially in the case of dredging-related contributions, to predict emissions of NOx and VOCs from the construction activities subject to USACE regulatory review (and $PM_{2.5}$ for DE commuting emissions) for conformity determination. The estimates detailed in Tables ESP EIS 2.9-2-1 through ESP EIS 2.9-2-8 are consistent with the level of detail available at the ESPA stage of the project and the PPE approach. This analysis combines robust estimates of expected equipment needs with very conservative estimates of hours of operation for each piece of equipment to provide significant conservatism to this conformity analysis. Despite using this enveloping approach, the predicted emissions from construction are below the *de minimis* levels for conformity for all of the respective pollutants (100 TPY NOx, 50 TPY VOC and 100 TPY $PM_{2.5}$). By definition in 40 CFR Part 93 - Subpart B, a prediction of *de minimis* impacts for a conformity analysis precludes the need for a conformity determination analysis to determine emission offsets. Further, a *de minimis* level of emissions is designed to indicate that this project will not adversely interfere with any State Implementation Plan (SIP) in place for the specific nonattainment area.

Associated PSEG Site ESP Application Revisions:

None.

References:

ESP EIS 2.9-2-1
Delaware River Main Channel Deepening Project General Conformity Analysis and Mitigation Report, Moffatt and Nichol, revised December 2009.

ESP EIS 2.9-2-2
Locomotive Emissions Standards Regulatory Support Document, EPA, April 1998.

ESP EIS 2.9-2-3
Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition, USEPA, July 2010

ESP EIS 2.9-2-4
Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling-Compression-Ignition, EPA July 2010

ESP EIS 2.9-2-5
EPA Mobile6.2 Vehicle Emission Modeling Software, http://www.epa.gov/otaq/m6.htm. Date accessed February 6, 2012

ESP EIS 2.9-2-6
Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", EPA, 2010

ESP EIS 2.9-2-7
AP-42 Compilation of Air Pollutant Emission Factors, EPA, January 2011

List of Tables

Table ESP EIS 2.9-2-1
Total Construction Emission Summary - New Jersey (NJ)

USACE Construction Activity - NJ	Total Project Emissions By Year (tons)													
	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC
Year	Year 1	Year 1	Year 2	Year 2	Year 3	Year 3	Year 4	Year 4	Year 5	Year 5	Year 6	Year 6	Year 7	Year 7
Commuter / Haul Vehicles	8.27	1.96	7.21	1.53	6.15	1.34	5.06	1.28	4.47	1.23	0.64	0.76	0.62	0.72
Construction Equipment	68.14	5.09	66.77	4.78	64.96	4.33	7.81	2.35	7.24	2.32	0.29	0.33	0.28	0.31
Total Project Emissions	**76.41**	**7.05**	**73.99**	**6.31**	**71.11**	**5.67**	**12.87**	**3.63**	**11.70**	**3.56**	**0.93**	**1.08**	**0.90**	**1.03**
Conformity De Minimis (TPY)	100	50	100	50	100	50	100	50	100	50	100	50	100	50
Total Emissions below De Minimis? (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table ESP EIS 2.9-2-2
Total Construction Emission Summary - Delaware (DE)

USACE Construction Activity - DE	Total Project Emissions By Year (tons)																				
	NOx	$PM_{2.5}$	VOC	NOx	$PM_{2.5}$	VOC	NOx	$PM_{2.5}$	VOC	NOx	$PM_{2.5}$	VOC	NOx	$PM_{2.5}$	VOC	NOx	$PM_{2.5}$	VOC	NOx	$PM_{2.5}$	VOC
Year	Year 1	Year 1	Year 1	Year 2	Year 2	Year 2	Year 3	Year 3	Year 3	Year 4	Year 4	Year 4	Year 5	Year 5	Year 5	Year 6	Year 6	Year 6	Year 7	Year 7	Year 7
Commuter Vehicles	0.10	0.003	0.12	0.09	0.003	0.11	0.08	0.003	0.09	0.07	0.003	0.09	0.07	0.003	0.08	0.07	0.003	0.08	0.06	0.003	0.08
Commuter Vehicles (Fugitive Emissions)	n/a	0.079	n/a	n/a	0.077	n/a	n/a	0.074	n/a	n/a	0.074	n/a	n/a	0.074	n/a	n/a	0.074	n/a	n/a	0.074	n/a
Total Project Emissions	**0.10**	**0.08**	**0.12**	**0.09**	**0.08**	**0.11**	**0.08**	**0.08**	**0.09**	**0.07**	**0.08**	**0.09**	**0.07**	**0.08**	**0.08**	**0.07**	**0.08**	**0.08**	**0.06**	**0.08**	**0.08**
Conformity De Minimis (TPY)	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50
Total Emissions below De Minimis? (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table ESP EIS 2.9-2-3
Required Emissions Information and Parameters for Pollutant-Specific Equipment Emission Rate Calculations

Description	Rated HP	Fuel Type	**EFss** - Zero-hour steady state emission rate (g/hp-hr)		**DF**[1,2] - Deterioration Factor (unitless) = 1+A*(expended life of equipment)	
			NOx	**VOC**	**NOx**	**VOC**
					A=.008	A=.027
ALL NON-ROAD ENGINES[1] - PSEG SITE CONSTRUCTION						
Pan Scraper	400	DIESEL	0.2760	0.1340	1.004	1.014
Bulldozers	360	DIESEL	0.2760	0.1340	1.004	1.014
Trackhoes	295	DIESEL	0.2760	0.1340	1.004	1.014
Vibratory Rollers	200	DIESEL	0.2760	0.1340	1.004	1.014
Gradall	150	DIESEL	0.2760	0.1340	1.004	1.014
Backhoe	150	DIESEL	0.2760	0.1340	1.004	1.014
Dewatering Pump	10	DIESEL	4.3000	0.5618	1.004	1.014
Generators	15	Gasoline	3.50	5.20	n/a	n/a
ALL NON-ROAD ENGINES[1] - WETLAND MITIGATION						
Suction Dredge	600	DIESEL	0.2760	0.1340	1.004	1.014
Bulldozers	360	DIESEL	0.2760	0.1340	1.004	1.014
Trackhoes	295	DIESEL	0.2760	0.1340	1.004	1.014
Dump Trucks	250	DIESEL	0.2760	0.1340	1.004	1.014
Backhoe	150	DIESEL	0.2760	0.1340	1.004	1.014
Dewatering Pump	10	DIESEL	4.3000	0.5618	1.004	1.014
Generators	15	Gasoline	3.50	5.20	n/a	n/a

Notes:

[1]All calculations assume equipment of Tier 4 quality for emissions. Tier 4 represents engines manufactured within the previous few years of the start of the construction period. Based on historical projects and normal fleet turnover in the construction industry, the project anticipates the typical construction vehicle age to be 3 years old or newer. Tier 4 represents this average age for all years through the project cycle of 7 years.

[2] Equipment average state of useful life expended is 50% for deterioration consideration for compression ignition engines.

[3] VOC Emission factor (Efss) conservatively includes methane (2%) into VOC estimate - total hydrocarbon instead of non-methane hydrocarbon.

References:

Emission Factors (Efss) and their adjustments (TAF, DF, etc) for diesel equipment were taken from Reference ESP EIS 2.9-2-4 "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling-Compression-Ignition", USEPA July 2010.

Emission Factors (Efss) and their adjustments for gasoline equipment were taken from Reference ESP EIS 2.9-2-3 "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition", USEPA, July 2010, assuming 4-stroke overhead valve engines.

Table ESP EIS 2.9-2-4
Hours of Use for Each Piece of Equipment by Year of Project

Equipment Type	Fuel	Year 1 Hours	Year 2 Hours	Year 3 Hours	Year 4 Hours	Year 5 Hours	Year 6 Hours	Year 7 Hours
PSEG Site Construction								
Pan Scraper	Diesel	3000	3000	3000	3000	3000	0	0
Bulldozers	Diesel	3000	3000	3000	3000	3000	0	0
Trackhoes	Diesel	3000	3000	3000	3000	3000	0	0
Vibratory Rollers	Diesel	3000	3000	3000	3000	3000	0	0
Gradall	Diesel	3000	3000	3000	3000	3000	0	0
Backhoe	Diesel	3000	3000	3000	3000	3000	0	0
Dewatering Pump	Diesel	120	120	120	120	120	120	120
Generators	Gasoline	500	500	500	500	500	500	500
On-Site Trucks	Gasoline	3000	3000	3000	3000	3000	3000	3000
Marine Dredge	Diesel	480	480	480	0	0	0	0
Marine Tugs	Diesel	480	480	480	0	0	0	0
Marine Survey Boat	Diesel	480	480	480	0	0	0	0
Wetland Mitigation								
Suction Dredge	Diesel	2000	1200	0	0	0	0	0
Bulldozers	Diesel	2000	1200	0	0	0	0	0
Trackhoes	Diesel	2000	1200	0	0	0	0	0
Generators	Gasoline	200	200	0	0	0	0	0
On-Site Trucks	Gasoline	2000	1200	0	0	0	0	0
Dump Trucks	Diesel	2000	1200	0	0	0	0	0
Backhoe	Diesel	2000	1200	0	0	0	0	0
Dewatering Pump	Diesel	2000	1200	0	0	0	0	0
Small Survey Boat	Diesel	2000	1200	0	0	0	0	0

Notes:

1. PSEG Site Construction - Equipment Hours conservatively assumed each piece of equipment to operate 10 hours / day, 6 days / week construction, for 50 weeks per year (3000 hours) for main construction. PSEG Site Construction includes Causeway construction.
2. Reduced hours for Dewatering Pumps and Generators reflect assumed use on an "as needed" basis.
3. Marine dredging equipment is conservatively assumed for 2 months / year for the first 3 years. (8 weeks x 60 hours / week)
4. Wetlands Mitigation - Equipment Hours conservatively assume each piece of equipment will operate 200 hours / month for 10 months in year 1, and 6 months in year 2, excepting generators.
5. On-Site Trucks are small, gasoline fueled, pickup / utility style trucks with GVWR less than 6,000 pounds.

Table ESP EIS 2.9-2-5
Emissions from Construction Equipment
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Equipment Type	Fuel	Capacity (hp)	Load Factor[2] (%)	Loaded Power Use (hp)	Equipment Count	Emission Factors NOx[1] g/hp-hr	Emission Factors VOC[1] g/hp-hr	Total Project Emissions by Year NOx (tons) Year 1	VOC (tons) Year 1	NOx (tons) Year 2	VOC (tons) Year 2	NOx (tons) Year 3	VOC (tons) Year 3	NOx (tons) Year 4	VOC (tons) Year 4
PSEG SITE CONSTRUCTION															
Pan Scraper	Diesel	400	59%	236	6	0.28	0.14	1.30	0.64	1.30	0.64	1.30	0.64	1.30	0.64
Bulldozers	Diesel	360	59%	212.4	6	0.28	0.14	1.17	0.57	1.17	0.57	1.17	0.57	1.17	0.57
Trackhoes	Diesel	295	21%	61.95	2	0.28	0.14	0.11	0.06	0.11	0.06	0.11	0.06	0.11	0.06
Vibratory Rollers	Diesel	200	59%	118	4	0.28	0.14	0.43	0.21	0.43	0.21	0.43	0.21	0.43	0.21
Gradall	Diesel	150	59%	88.5	1	0.28	0.14	0.08	0.04	0.08	0.04	0.08	0.04	0.08	0.04
Backhoe	Diesel	150	21%	31.5	2	0.28	0.14	0.06	0.03	0.06	0.03	0.06	0.03	0.06	0.03
Dewatering Pump	Diesel	10	59%	5.9	10	4.32	0.57	0.03	0.00	0.03	0.00	0.03	0.00	0.03	0.00
Generators[3]	Gasoline	15	68%	10.2	2	3.50	5.20	0.04	0.06	0.04	0.06	0.04	0.06	0.04	0.06
On-Site Trucks	Diesel	n/a	n/a	n/a	5	see Table 7		0.27	0.34	0.25	0.32	0.23	0.31	0.22	0.29
Fill Hauling Vehicles	Diesel	n/a	n/a	n/a	n/a	see Table 7		7.02	0.49	6.31	0.47	5.40	0.46	4.36	0.45
Marine Dredge[4]	Diesel	12,310	69%	8,524	1	12.38	0.43	55.84	1.94	55.84	1.94	55.84	1.94	0.00	0.00
Marine Tugs[5]	Diesel	250	20%	50	2	4.46	0.26	0.24	0.01	0.24	0.01	0.24	0.01	0.00	0.00
Marine Survey Boat[5]	Diesel	100	15%	15	1	3.82	0.20	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00
WETLAND MITIGATION															
Suction Dredge	Diesel	600	59%	354	2	0.28	0.14	0.43	0.21	0.26	0.13	0.00	0.00	0.00	0.00
Bulldozers	Diesel	360	59%	212.4	2	0.28	0.14	0.26	0.13	0.16	0.08	0.00	0.00	0.00	0.00
Trackhoes	Diesel	295	21%	61.95	2	0.28	0.14	0.08	0.04	0.05	0.02	0.00	0.00	0.00	0.00
Dump Trucks	Diesel	250	59%	147.5	3	0.28	0.14	0.27	0.13	0.16	0.08	0.00	0.00	0.00	0.00
On-Site Trucks[6]	Diesel	n/a	n/a	n/a	3	see Table 7		0.10	0.12	0.06	0.07	0.00	0.00	0.00	0.00
Backhoe	Diesel	150	21%	31.5	1	0.28	0.14	0.02	0.01	0.01	0.01	0.00	0.00	0.00	0.00
Dewatering Pump	Diesel	10	59%	5.9	3	4.32	0.57	0.17	0.02	0.10	0.01	0.00	0.00	0.00	0.00
Generators[3]	Gasoline	15	68%	10.2	2	3.50	5.20	0.02	0.02	0.02	0.02	0.00	0.00	0.00	0.00
Marine Survey Boat[5]	Diesel	75	15%	11.25	2	3.82	0.20	0.19	0.01	0.11	0.01	0.00	0.00	0.00	0.00
Total Emissions								**68.14**	**5.09**	**66.77**	**4.78**	**64.96**	**4.33**	**7.81**	**2.35**

Table ESP EIS 2.9-2-5
Emissions from Construction Equipment
Page 2 of 3

Equipment Type	Fuel	Capacity (hp)	Load Factor[2] (%)	Loaded Power Use (hp)	Equipment Count	Emission Factors NOx[1] g/hp-hr	Emission Factors VOC[1] g/hp-hr	Total Project Emissions by Year NOx (tons) Year 5	VOC (tons) Year 5	NOx (tons) Year 6	VOC (tons) Year 6	NOx (tons) Year 7	VOC (tons) Year 7
PSEG SITE CONSTRUCTION													
Pan Scraper	Diesel	400	59%	236	6	0.28	0.14	1.30	0.64	0.00	0.00	0.00	0.00
Bulldozers	Diesel	360	59%	212.4	6	0.28	0.14	1.17	0.57	0.00	0.00	0.00	0.00
Trackhoes	Diesel	295	21%	61.95	2	0.28	0.14	0.11	0.06	0.00	0.00	0.00	0.00
Vibratory Rollers	Diesel	200	59%	118	4	0.28	0.14	0.43	0.21	0.00	0.00	0.00	0.00
Gradall	Diesel	150	59%	88.5	1	0.28	0.14	0.08	0.04	0.00	0.00	0.00	0.00
Backhoe	Diesel	150	21%	31.5	2	0.28	0.14	0.06	0.03	0.00	0.00	0.00	0.00
Dewatering Pump	Diesel	10	59%	5.9	10	4.32	0.57	0.03	0.00	0.03	0.00	0.03	0.00
Generators[3]	Gasoline	15	68%	10.2	2	3.50	5.20	0.04	0.06	0.04	0.06	0.04	0.06
On-Site Trucks	Diesel	n/a	n/a	n/a	5	see Table 7		0.21	0.28	0.20	0.26	0.20	0.24
Fill Hauling Vehicles	Diesel	n/a	n/a	n/a	n/a	see Table 7		3.80	0.44	0.01	0.00	0.01	0.00
Marine Dredge[4]	Diesel	12,310	69%	8,524	1	12.38	0.43	0.00	0.00	0.00	0.00	0.00	0.00
Marine Tugs[5]	Diesel	250	20%	50	2	4.46	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Marine Survey Boat[5]	Diesel	100	15%	15	1	3.82	0.20	0.00	0.00	0.00	0.00	0.00	0.00
WETLAND MITIGATION													
Suction Dredge	Diesel	600	59%	354	2	0.28	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Bulldozers	Diesel	360	59%	212.4	2	0.28	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Trackhoes	Diesel	295	21%	61.95	2	0.28	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Dump Trucks	Diesel	250	59%	147.5	3	0.28	0.14	0.00	0.00	0.00	0.00	0.00	0.00
On-Site Trucks[6]	Diesel	n/a	n/a	n/a	3	see Table 7		0.00	0.00	0.00	0.00	0.00	0.00
Backhoe	Diesel	150	21%	31.5	1	0.28	0.14	0.00	0.00	0.00	0.00	0.00	0.00
Dewatering Pump	Diesel	10	59%	5.9	3	4.32	0.57	0.00	0.00	0.00	0.00	0.00	0.00
Generators[3]	Gasoline	15	68%	10.2	2	3.50	5.20	0.00	0.00	0.00	0.00	0.00	0.00
Marine Survey Boat[5]	Diesel	75	15%	11.25	2	3.82	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Total Emissions								**7.24**	**2.32**	**0.29**	**0.33**	**0.28**	**0.31**

Table ESP EIS 2.9-2-5
Emissions from Construction Equipment
Page 3 of 3

Emission Factor References (see Table ESP EIS 2.9-2-3 for definition of factors used below)

The gram/hp-hr pollutant-specific diesel emission rates are calculated from Reference ESP EIS 2.9-2-4 "Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling-Compression-Ignition", USEPA July 2010 as:

[1] NOx and VOC calculation = EFss * TAF * DF

[2] Load factors were taken from Reference ESP EIS 2.9-2-6 Appendix A of "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", USEPA, 2010.

[3] Generator emission factors and their adjustments for gasoline equipment were taken from Reference ESP EIS 2.9-2-3 "Exhaust Emission Factors for Nonroad Engine Modeling: Spark-Ignition", USEPA July, 2010.

[4] Emission Factor for Marine Dredge based upon locomotive-style engine. Environmental Protection Agency - "Locomotive Emissions Standards Regulatory Support Document", April 1998, and assumes similar methodology to the Delaware River Deepening Project General Conformity Dredging calculations.

[5] Marine diesels for tugs and survey boat assumed to be T2M (2006 or newer) engines.

[6] On-Site trucks (3) for Wetland Mitigation conservatively assumed 40 hours / week at highway speeds.

Table ESP EIS 2.9-2-6
Emission Factors using EPA Mobile6.2 Model - Years 2015-2021
Page 1 of 2

Vehicle Type	Year	Mobile6 Classification	Mobile6 Definition	Emission Factor (g/mi)		
				NOx	$PM_{2.5}$	VOC
Commuter Vehicles	2015	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.386	0.0112	0.445
On-Site Trucks	2015	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.403	n/a	0.515
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2015	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	4.22	n/a	0.294
Commuter Vehicles	2016	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.356	0.0112	0.414
On-Site Trucks	2016	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.373	n/a	0.486
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2016	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	3.794	n/a	0.285
Commuter Vehicles	2017	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.33	0.0112	0.388
On-Site Trucks	2017	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.352	n/a	0.462
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2017	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	3.254	n/a	0.277
Commuter Vehicles	2018	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.308	0.0112	0.366
On-Site Trucks	2018	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.331	n/a	0.438
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2018	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	2.63	n/a	0.271
Commuter Vehicles	2019	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.291	0.0112	0.349
On-Site Trucks	2019	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.318	n/a	0.42
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2019	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	2.293	n/a	0.265

Table ESP EIS 2.9-2-6
Emission Factors using EPA Mobile6.2 Model - Years 2015-2021
Page 2 of 2

Vehicle Type	Year	Mobile6 Classification	Mobile6 Definition	Emission Factor (g/mi)		
				NOx	$PM_{2.5}$	VOC
Commuter Vehicles	2020	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.278	0.0112	0.332
On-Site Trucks	2020	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.309	n/a	0.395
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2020	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	2.001	n/a	0.259
Commuter Vehicles	2021	LDGV	Light Duty Gasoline Vehicles (Passenger Cars)	0.268	0.0112	0.318
On-Site Trucks	2021	LDGT1	Light Duty Gasoline Trucks 1 (0-6000 lbs GVWR)	0.301	n/a	0.37
Heavy Duty Diesel Truck (18 wheel fill haulers / deliveries)	2021	HDDV8b	Heavy-Duty Diesel Trucks 8b (>60,000 lbs. GVWR)	1.761	n/a	0.255

Notes:
1. In this table, Year 1 is assumed to be 2015 with Year 7 as 2021. Actual calendar years are used in Reference ESP EIS 2.9-2-5 EPA Mobile6.2 Model.

2. This table assumes trucks travel an average of 40 miles per hour for emission factor determination from Reference ESP EIS 2.9-2-5, EPA Mobile6.2 for Years 2015-2021.

Table ESP EIS 2.9-2-7
Emissions from Mobile Sources - Reporting Years 2015-2021
Page 1 of 3

Type of Mobile Source	Type used in Mobile6	Fuel Used	Year	Days Used	Trip Distance (miles)	Number of Trips		Emission Factors (grams/mile) NO_x	PM2.5	VOC	Total Emissions (tpy) NO_x	$PM_{2.5}$	VOC
NJ Commuter Vehicles	LDGV	Gasoline	2015	300	40	168	per day	0.386	n/a	0.445	0.858	n/a	0.989
DE Commuter Vehicles in NJ	LDGV	Gasoline	2015	300	22	44	per day	0.386	n/a	0.445	0.124	n/a	0.142
DE Commuter Vehicles in DE	LDGV	Gasoline	2015	300	18	44	per day	0.386	0.011	0.445	0.101	0.003	0.117
On-Site Trucks	LDGT1	Gasoline	2015	300	400	5	per day	0.403	n/a	0.515	0.267	n/a	0.341
Delivery / Haul Vehicles	HDDV8b	Diesel	2015	n/a	50	30,175	total	4.220	n/a	0.294	7.018	n/a	0.489
									2015 Totals:		8.367	0.003	2.077
NJ Commuter Vehicles	LDGV	Gasoline	2016	300	40	168	per day	0.356	n/a	0.414	0.791	n/a	0.920
DE Commuter Vehicles in NJ	LDGV	Gasoline	2016	300	22	44	per day	0.356	n/a	0.414	0.114	n/a	0.133
DE Commuter Vehicles in DE	LDGV	Gasoline	2016	300	18	44	per day	0.356	0.011	0.414	0.093	0.003	0.108
On-Site Trucks	LDGT1	Gasoline	2016	300	400	5	per day	0.373	n/a	0.486	0.247	n/a	0.321
Delivery / Haul Vehicles	HDDV8b	Diesel	2016	n/a	50	30,175	total	3.794	n/a	0.285	6.310	n/a	0.474
									2016 Totals:		7.555	0.003	1.956
NJ Commuter Vehicles	LDGV	Gasoline	2017	300	40	150	per day	0.330	n/a	0.388	0.655	n/a	0.770
DE Commuter Vehicles in NJ	LDGV	Gasoline	2017	300	22	40	per day	0.330	n/a	0.388	0.096	n/a	0.113
DE Commuter Vehicles in DE	LDGV	Gasoline	2017	300	18	40	per day	0.330	0.011	0.388	0.079	0.003	0.092
On-Site Trucks	LDGT1	Gasoline	2017	300	400	5	per day	0.352	N/A	0.462	0.233	n/a	0.306
Delivery / Haul Vehicles	HDDV8b	Diesel	2017	n/a	50	30,100	total	3.254	N/A	0.277	5.398	n/a	0.460
									2017 Totals:		6.461	0.003	1.740
NJ Commuter Vehicles	LDGV	Gasoline	2018	300	40	150	per day	0.308	n/a	0.366	0.611	n/a	0.726
DE Commuter Vehicles in NJ	LDGV	Gasoline	2018	300	22	40	per day	0.308	n/a	0.366	0.090	n/a	0.107
DE Commuter Vehicles in DE	LDGV	Gasoline	2018	300	18	40	per day	0.308	0.011	0.366	0.073	0.003	0.087
On-Site Trucks	LDGT1	Gasoline	2018	300	400	5	per day	0.331	n/a	0.438	0.219	n/a	0.290
Delivery / Haul Vehicles	HDDV8b	Diesel	2018	n/a	50	30,100	total	2.630	n/a	0.271	4.363	n/a	0.450
									2018 Totals:		5.356	0.003	1.659

Table ESP EIS 2.9-2-7
Emissions from Mobile Sources - Reporting Years 2015-2021
Page 2 of 3

Type of Mobile Source	Type used in Mobile6	Fuel Used	Year	Days Used	Trip Distance (miles)	Number of Trips		Emission Factors (grams/mile) NO_x	Emission Factors (grams/mile) $PM_{2.5}$	Emission Factors (grams/mile) VOC	Total Emissions (tpy) NO_x	Total Emissions (tpy) $PM_{2.5}$	Total Emissions (tpy) VOC
NJ Commuter Vehicles	LDGV	Gasoline	2019	300	40	150	per day	0.291	n/a	0.349	0.577	n/a	0.692
DE Commuter Vehicles in NJ	LDGV	Gasoline	2019	300	22	40	per day	0.291	n/a	0.349	0.085	n/a	0.102
DE Commuter Vehicles in DE	LDGV	Gasoline	2019	300	18	40	per day	0.291	0.011	0.349	0.069	0.003	0.083
On-Site Trucks	LDGT1	Gasoline	2019	300	400	5	per day	0.318	n/a	0.420	0.210	n/a	0.278
Delivery / Haul Vehicles	HDDV8b	Diesel	2019	n/a	50	30,100	total	2.293	n/a	0.265	3.804	n/a	0.440
										2019 Totals:	4.746	0.003	1.595
NJ Commuter Vehicles	LDGV	Gasoline	2020	300	40	150	per day	0.278	n/a	0.332	0.552	n/a	0.659
DE Commuter Vehicles in NJ	LDGV	Gasoline	2020	300	22	40	per day	0.278	n/a	0.332	0.081	n/a	0.097
DE Commuter Vehicles in DE	LDGV	Gasoline	2020	300	18	40	per day	0.278	0.011	0.332	0.066	0.003	0.079
On-Site Trucks	LDGT1	Gasoline	2020	300	400	5	per day	0.309	n/a	0.395	0.204	n/a	0.261
Delivery / Haul Vehicles	HDDV8b	Diesel	2020	n/a	50	100	total	2.001	n/a	0.259	0.011	n/a	0.001
										2020 Totals:	0.914	0.003	1.097
NJ Commuter Vehicles	LDGV	Gasoline	2021	300	40	150	per day	0.268	n/a	0.318	0.532	n/a	0.631
DE Commuter Vehicles in NJ	LDGV	Gasoline	2021	300	22	40	per day	0.268	n/a	0.318	0.078	n/a	0.093
DE Commuter Vehicles in DE	LDGV	Gasoline	2021	300	18	40	per day	0.268	0.011	0.318	0.064	0.003	0.076
On-Site Trucks	LDGT1	Gasoline	2021	300	400	5	per day	0.301	n/a	0.370	0.199	n/a	0.245
Delivery / Haul Vehicles	HDDV8b	Diesel	2021	n/a	50	100	total	1.761	n/a	0.255	0.010	n/a	0.001
										2021 Totals:	0.882	0.003	1.045

Table ESP EIS 2.9-2-7
Emissions from Mobile Sources - Reporting Years 2015-2021
Page 3 of 3

Notes:

1. Commuting workers for USACE-regulated scope at the PSEG Site are assumed to be 3% of total workforce at site (123 workers of 4100 total).
2. Factor of 1.3 workers / commuting vehicle applied to account for carpooling (95 commuter vehicles / day) per Traffic Impact Analysis.
3. Commuting workers for Wetland Mitigation assumed to be 15 workers (11 commute vehicles).
4. Commuters assumed to average 40 miles each way for commute, 6 days week / 50 weeks per year.
5. It is assumed that 20.6% of commuters come from Delaware each day (New Castle County) based upon Traffic Impact Analysis.
6. PSEG Site Construction On-Site Trucks (5) assumed to run 10 hours / day, 6 days / week, 50 weeks / year. For conservatism, highway speeds assumed.
7. Material delivery trucks based upon projected 5-year need of 3,000,000 cubic yards of fill, using 20 cubic yard capacity diesel powered vehicles.
8. Assumes average round-trip for fill truck to site is 50 miles.
9. Fill material haul vehicles equal 30,000 trips / year (Years 1-5). 100 extra trips / year assumed for supply delivery vehicles for PSEG Site Construction (all years).
10. An additional 75 trips / year assumed for supply delivery vehicles for Wetland Mitigation (Years 1 and 2).
11. As in Table 6, note that in this table, Year 1 is assumed to be 2015 with Year 7 as 2021. Actual calendar years are used in EPA Mobile6.2 Model.

Table ESP EIS 2.9-2-8
Paved Road Fugitive $PM_{2.5}$ Emission Calculation for DE Nonattainment Area

Description	Mean Vehicle Weight (tons)	Mileage (VMT)	Emission Factor (lb/VMT) $PM_{2.5}$	Emissions (tons) $PM_{2.5}$
Annual Emissions				
Year 1 DE Traffic	2.00	230,400	6.88E-04	**0.079**
Year 2 DE Traffic	2.00	224,640	6.88E-04	**0.077**
Year 3 DE Traffic	2.00	216,000	6.88E-04	**0.074**
Year 4 DE Traffic	2.00	216,000	6.88E-04	**0.074**
Year 5 DE Traffic	2.00	216,000	6.88E-04	**0.074**
Year 6 DE Traffic	2.00	216,000	6.88E-04	**0.074**
Year 7 DE Traffic	2.00	216,000	6.88E-04	**0.074**

Notes:

Emission Factor Derivation: $E = (k(sL)^{0.91}(W)^{1.02})$ AP-42 Section 13.2.1 (1/2011 version) (Reference ESP EIS 2.9-2.7)

where:

E = particulate emission factor (lb/VMT)
k = particle size multiplier
sL = road surface silt loading (g/m^2)
W = average vehicle weight (tons)

	PM	PM_{10}	$PM_{2.5}$	Units	AP-42 Reference ESP EIS 2.9-2.7
k factor	0.011	0.0022	0.00054	lb/VMT	Table 13.2-1.1
Silt Loading, sL	0.6	0.6	0.6	g/m^2	Table 13.2.1-3 (worst-case non-winter)

Description	Mean Vehicle Weight (tons)	Distance (miles)	Trips (#)	Mileage (VMT)	Assumptions
Year 1 Commuter Traffic	2.0	18	12,800	230,400	See Assumptions 1-4 below.
Year 2 Commuter Traffic	2.0	18	12,480	224,640	See Assumptions 1-4 below.
Year 3 Commuter Traffic	2.0	18	12,000	216,000	See Assumptions 1-4 below.
Year 4 Commuter Traffic	2.0	18	12,000	216,000	See Assumptions 1-4 below.
Year 5 Commuter Traffic	2.0	18	12,000	216,000	See Assumptions 1-4 below.
Year 6 Commuter Traffic	2.0	18	12,000	216,000	See Assumptions 1-4 below.
Year 7 Commuter Traffic	2.0	18	12,000	216,000	See Assumptions 1-4 below.

Assumptions:

1. An average 18-mile one way trip (i.e. 36 mile round trip) in Delaware is assumed for each for commuter vehicle.
2. 29 commuter vehicle round trips / day in DE are assumed in Year 1 and 2, and 20 / day in years 3 to 7.
3. Assumed 50 weeks / year for PSEG Site Construction. For Wetland Mitigation assumed 40 weeks in Year 1 and 24 weeks in Year 2.
4. PSEG Site Construction workers assumed to typically commute 6 days / week and for Wetland Mitigation 5 days / week.

Response to RAI No. rMET-09SB (Env-08S), Question ESP EIS 2.9-3:

The NRC staff asked PSEG for information regarding the electronic input and output files used in SACTI (Seasonal/Annual Cooling Tower Impact) modeling, along with supporting onsite meteorological data files used in support of the Environmental Report. The specific request was:

> *rMET-09SB: Provide all electronic input and output files used in SACTI (Seasonal/Annual Cooling Tower Impact) modeling, along with supporting onsite meteorological data files.*
>
> *Supporting Information: Under ESRP 5.3.3, the following cooling tower data or information should be obtained:*
>
> *These data are required by the NRC staff to perform independent evaluations and assessments of potential impacts of heat dissipation on the atmosphere.*

PSEG Response to NRC RAI:

As requested, PSEG has provided input and output files used in SACTI modeling, as well as the relevant supporting onsite meteorological data files. Enclosure 2 provides the complete set of files. Attachment A, provided in Enclosure 2, includes a narrative description of the process used to compile the relevant file information for use in SACTI and Attachment B, also provided in Enclosure 2, includes a listing of the input and output data files.

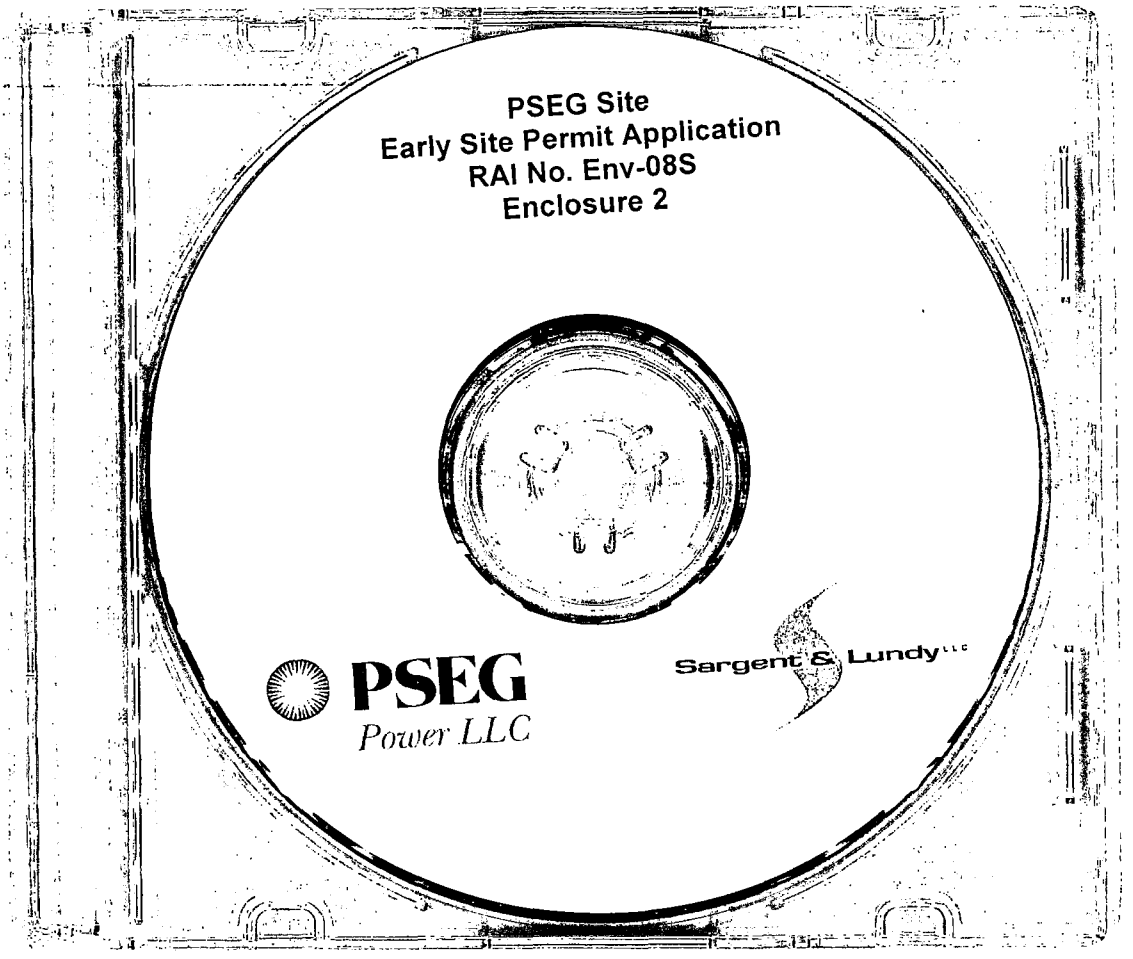
Associated PSEG Site ESP Application Revisions:

None.

PSEG Letter ND-2014-0007, dated February 27, 2014

ENCLOSURE 2

CD-ROM Containing Files Requested for Docketing in RAI No. Env-08S


PSEG Site
Early Site Permit Application
RAI No. Env-08S
Enclosure 2
PSEG
Power LLC
Sargent & Lundy LLC