SYNTHETIC MINOR ORDER
PRELIMINARY DETERMINATION TO APPROVE

Olympic Region Clean Air Agency

Issued to:	**Washington State Department of Enterprise Services**	**County:**	**67**
Location:	**DES Capitol Campus** **Olympia, WA 98504**	**Source:** **RC:**	**811** **RC1**
Application #	**19SMO1416**	**File:**	**690**
Prepared on:	**July 9, 2020**		

1. Background

Washington State Department of Enterprise Services is requesting a voluntary limit on emissions to establish the Washington State Capitol Campus (Capitol Campus) as a minor source with respect to the Washington State Operating Permit Regulation in Chapter 173-401 WAC.

Washington State Capitol Campus is located in downtown Olympia between the Governor's Mansion (west border) to Cherry Street (east border) and between Union Ave SE (north) to Maple Park Ave SE (south) (see map below). The campus relies on several boilers for heat and diesel-fired engines for emergency power (see Table 1 and Table 2 for a full list of relevant equipment) that have been registered with ORCAA throughout the past thirty years. Prior to 2011, these boilers and engines were under the responsibility of different agencies and were, therefore, registered as several minor sources with ORCAA. In 2011, Washington State Department of Enterprise Services (DES) was formed with statutory responsibility for the care and custody of the Washington State Capitol Campus. ORCAA staff determined that these sources qualified as one major source when this change occurred in 2011. This determination is based on the definition of a major source in Chapter 173-401 WAC (see Section 6) and combined potential to emit (PTE) of Nitrogen Oxides (NOx), which exceeds the regulatory threshold requiring an Operating Permit. However, according to DES, actual NOx emissions are consistently well below the 100 tons per year threshold. Because of this, DES requests a voluntary limit to establish the Capitol Campus as a minor source with respect to the Operating Permit program.

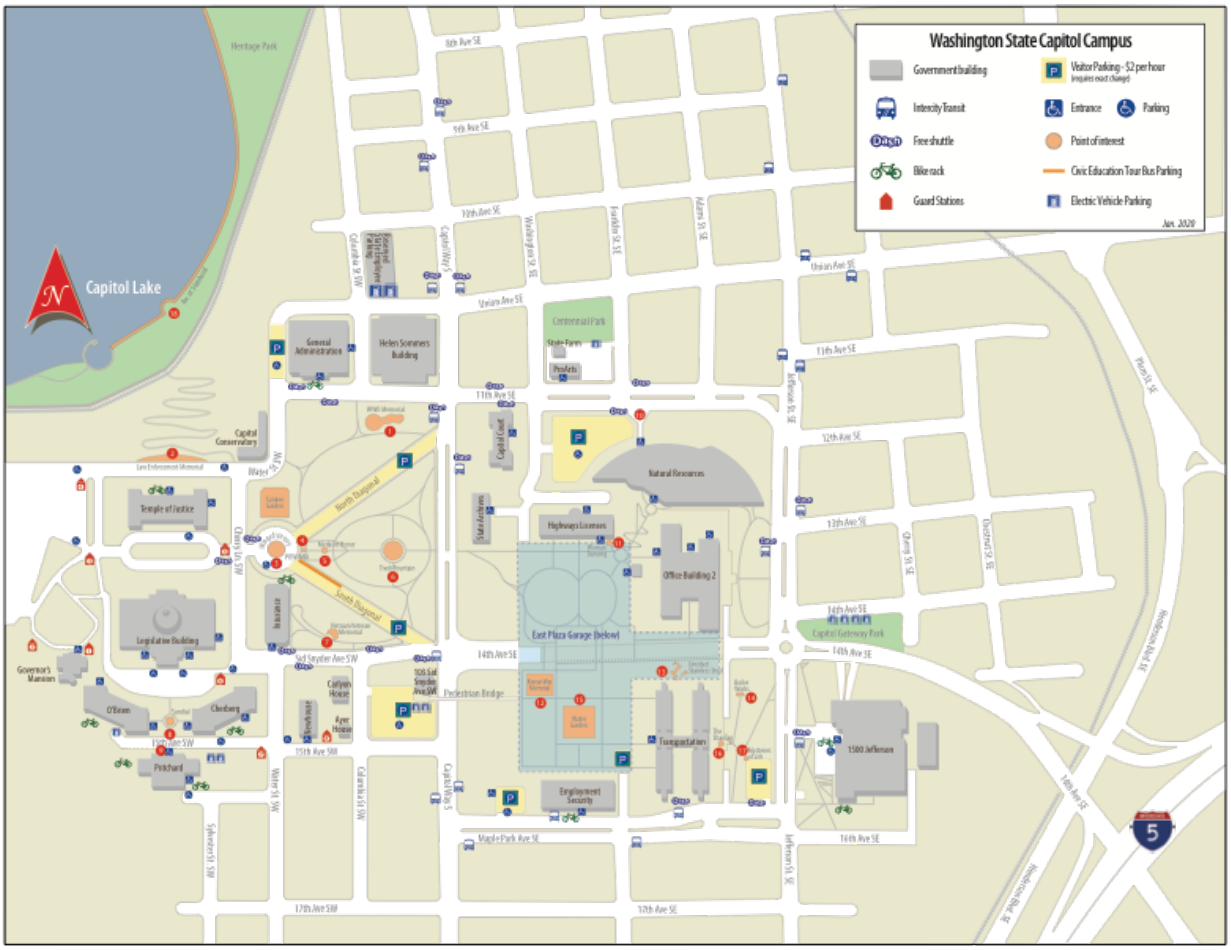

Figure 1: "Washington State Capitol Campus." Des.gov, Department of Enterprise Services, Jan. 2020, http://des.wa.gov/sites/default/files/public/documents/campus-map.pdf.

2. Synthetic Minor Order

A "Synthetic Minor" source is any source that requires a voluntary limit on emissions to be considered a minor source, where potential to emit (PTE) is greater than the major source thresholds: 100 tons per year (tpy) of any criteria pollutant, 10 tpy of any Hazardous Air Pollutant (HAP), and 25 tpy of total HAPs. A voluntary limit must be federally enforceable to establish a source as a synthetic minor source and is accomplished through a conditional Synthetic Minor Order (SMO) based on ORCAA Rule 6.1.12. A SMO is issued when a stationary source is a major source based on potential to emit, but the owner or operator wishes to be regulated as a minor source by maintaining actual emissions below the major source thresholds.

To ensure DES' emissions are less than the major source thresholds, DES requested a 99 ton per 12-consecutive month period voluntary limit on emissions of NOx. The request triggers ORCAA Rule 6.1.12, which requires the following:

1. Public noticing per ORCAA 6.1.3;

2. Enforceable emission limits on NOx applying to any 12-consecutive month period;
3. Continuous monitoring and compliance with the limit;
4. Annual Compliance certification by a Responsible Official; and,
5. Compliance assurance certifications forwarded to both EPA Region 10 and ORCAA.

3. Emission Units

The boilers and emergency engines currently located on Capitol Campus are listed below in Tables 1 and 2. All emission units are located on the Washington State Capitol Campus. Additionally, it is important to note that the Conditions of Approval from the associated Notices of Construction (NOC) for each emission unit listed below will still be in effect after issuance of the SMO (#19SMO1416).

Table 1: Boiler Emission Units

Boiler #	Size (MMBtu/Hr)	Associated NOC	Description	Location
EU1	42	10NOC751	Natural gas-fired only, except diesel as back-up and during periods of curtailment	Located at the Powerhouse on Capitol Lake
EU2	42			
EU3	38			

Table 2: Emergency Engine Emission Units

Engine #	Horsepower	Associated NOC	Description	Location
EU4	1500	92NOC481	KTA-50-G1	1115 Washington St
EU5	1100	17NOC1229	Cummins QSK23-DQCB	106 11th Ave SW (Hellen Sommers Building)
EU6	755	12NOC900	Cummins QSX15-G9	Located at the Powerhouse on Capital Lake
EU7	1850	10NOC751	Cummins KTA50	South of Natural Resources Building
EU8	900	10NOC751	Cummins VTA 28	NW corner of Legislative Building
EU9	800	10NOC751	Cummins NTA 1710	In Plaza Garage
EU10	3674	09NOC712	Detroit Diesel 20V4000G43	1500 Jefferson Street
EU11	3674			
EU12	3674			
EU13	3674			
EU14	3674			
EU15	1120		Detroit Diesel 12V2000G83	

Note: There were originally five engines approved at 1115 Washington St under NOC# 92NOC481. According to DES, four of the units are permanently disabled. Additionally, NOC #10NOC751 originally approved four engines; EU6 replaced one of those four original engines.

4. Potential to Emit

Pollutants that are emitted by Capitol Campus include emissions from combustion of natural gas and diesel including criteria pollutants, greenhouse gases, and hazardous air pollutants. Facility-wide Potential to Emit (PTE) was conservatively calculated by ORCAA staff to document and establish DES as a natural minor source for CO, PM, SO_2, VOC and Hazardous Air Pollutants (HAP). PTE is defined as the maximum capacity of a source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit an air pollutant (including air pollution control equipment, restrictions on hours of operation or on the type or amount of material combusted, stored, or processed) shall be treated as part of its operational design if the limitation is enforceable by ORCAA.

PTE for the emergency engines was estimated by assuming 500 hours of operation per year[1] and using emission factors from EPA's *Compilation of Air Pollutant Emissions Factors* (AP-42). For engines EU10-EU15, the federally enforceable NOx limits from the Approval Order for NOC# 09NOC712 were used instead of AP-42 emission factors.

The boilers are fired primarily with natural gas and only burn diesel as backup or during periods of natural gas curtailment. For purposes of calculating PTE, ORCAA staff assumed continuous operation (8,760 hours per year) and exclusive use of diesel to capture worst-case potential emissions under current physical and regulatory limitations. PTE was calculated using emission factors from AP-42.

Table 3: Facility-wide PTE

Pollutant	PTE (Tons per year)		
	Engines[a]	Boiler[c]	Total
NOx	90.5	77.0	167.4
CO	36.3	19.2	55.5
PM	4.6	7.7	12.3
SO_2	8.0E-4	0.8	0.8
VOC	4.7[b]	1.3	6.0
Total HAP	0.07	0.2	0.3

[a] Emission factors are from Chapter 3.4, Tables 3.4-1 and 3.4-2 for Large Stationary Diesel and Dual Fuel Engines (updated 10/96).

[b] Assume TOC (total organic compounds) emissions equal to VOC emissions.

[C] Emission factors are from AP-42, Chapter 1.3, Tables 1.3-1, 1.3-2, and 1.3-3 for Fuel Oil Combustion (updated 05/10).

[1] Environmental Protection Agency. *Calculating Potential to Emit (PTE) for Emergency Generators.* By John. S Seitz, Director: Office of Air Quality Planning and Standards. September 6, 1995.

5. SEPA Review

Enacted by the Washington Legislature in 1971, the State Environmental Policy Act (SEPA) helps state and local agencies in Washington identify possible environmental impacts that could result from governmental decisions such as issuing permits for private projects, adopting regulations, policies, or plans, or constructing public facilities such as new schools or highways. The SEPA review process helps agency decision-makers, applicants, and the public understand how the project proposal will affect the environment. In this case, ORCAA staff determined the project is exempt from SEPA requirements per WAC 197-11-800(13)(i) since it involves "the renewal or reissuance of a license regulating any present activity or structure so long as no material changes are involved."

6. Title V Air Operating Permit (AOP)

The State of Washington program pursuant to Title V of the federal Clean Air Act is governed under Chapter 173-401 WAC, the Washington Air Operating Permit Program. Chapter 173-401 WAC requires existing major stationary sources of air pollution to operate in compliance with an approved Air Operating Permit (AOP). An AOP (also known as a "Title V Permit" or "Part 70 Permit") combines into one document, all air-related requirements for operation of a "Major Source" of air pollution. Major Sources of air pollution are those that emit, or have the potential to emit, 100 tons per year or more of any criteria air pollutant, 10 tons per year or more of a hazardous air pollutant or 25 tons per year or more of combined hazardous air pollutants.

Review and Determination of AOP Applicability

ORCAA staff determined the following:

1. <u>The boilers and emergency engines (EU1-EU15) are located on contiguous or adjacent properties:</u> The parcels on which the boilers and engines are located are either adjacent or are connected by other parcels owned by DES.
2. <u>The boilers and emergency engines are under common control:</u> Prior to 2011, these boilers and engines were under the responsibility of different agencies and were, therefore, registered as several minor sources with ORCAA. In 2011, DES was formed with statutory responsibility for the care and custody of the Washington State Capitol Campus; all of the parcels on which the boilers and engines are located list DES as the owner.
3. <u>The boilers and emergency engines belong to a single major industrial grouping (same two digit SIC):</u> SIC Code 91 (Executive, Legislative, and General Government , except finance) applies to all sources.
4. <u>Potential to Emit (PTE) exceeds major source thresholds:</u> Facility-wide Potential to Emit (PTE) for NOx exceeds the regulatory threshold requiring an Air Operating Permit (100 tpy). **However, ORCAA staff determined an AOP is not required since the applicant requested a voluntary limit on emissions.** Additionally, PTE was conservatively calculated by ORCAA staff to document and establish DES as a natural minor source for CO, PM, SO_2, VOC and Hazardous Air Pollutants (HAP).

7. Public Involvement

A public notice of ORCAA's receipt of the NOC application, pursuant to ORCAA 6.1.3(a), was issued on April 22, 2020. No comments were received during the comment period.

This Preliminary Recommendation is being noticed for a 30-day public comment period in accordance with ORCAA Rule 6.1.3(c). In addition to noticing the 30-day public comment period on our website and in the local daily paper, ORCAA will notify our interested parties list and EPA Region 10. If significant public interest is expressed during the public comment period, a public hearing will be scheduled by ORCAA and the public comment period will be extended through the hearing date.

8. Conditions of Approval

The following conditions of approval are necessary for establishing and for monitoring the compliance of the federally enforceable voluntary limit requested by DES through this permitting action 19SMO1416:

1. **NOx Emission Limit:** Facility-wide emissions of oxides of nitrogen (NOx) shall be less than 99 tons per year (tpy) during any 12-consecutive month period.
   [Regulatory Basis: WAC 173-400-091; ORCAA 6.1.12]

2. **Calculating NOx Emissions:** Unless otherwise required by Condition #3, the owner or operator shall calculate facility-wide actual emissions of NOx on a monthly basis as follows:
   - **a.** Boilers:
     - **i.** Natural gas: AP-42 emission factors[2] and actual standard cubic feet of natural gas combusted shall be used for periods when the boilers combust natural gas.
     - **ii.** Diesel: AP-42 emission factors[3] and gallons of diesel combusted shall be used for periods when the boilers combust diesel.
   - **b.** Engines: AP-42 emission factors[4], actual engine run-time, and rated horsepower output shall be used.

   [Regulatory Basis: WAC 173-400-091; ORCAA 6.1.12]

[2] EPA's *Compilation of Air Pollutant Emissions Factors* (AP-42), Chapter 1.4, Table 1.4-1 for Natural Gas Combustion (updated 07/98)
[3] EPA's *Compilation of Air Pollutant Emissions Factors* (AP-42), Chapter 1.3, Table 1.3-1 for Fuel Oil Combustion (updated 05/10).
[4] EPA's *Compilation of Air Pollutant Emissions Factors* (AP-42), Chapter 3.4, Table 3.4-1 for Large Stationary Diesel Engines (updated 10/96)

3. **Alternative NOx Emission Factors:** If actual facility-wide NOx emissions exceed 80 tons per any 12-consecutive month period as calculated by Condition #2, the owner or operator shall develop and use emission unit-specific NOx emission factors in lieu of AP-42 emission factors to demonstrate compliance with the emission limit in Condition #1. Source testing shall be conducted no later than 180 days after the month in which the facility exceeds 80 tons per 12-consecutive month period. Performance testing shall follow the requirements in Condition #4.
   [Regulatory Basis: WAC 173-400-091; ORCAA 1.5(i); ORCAA 6.1.12]

4. **Performance Testing Requirements:** Whenever performance testing is required:
   - **a.** The owner or operator shall submit a notification of the intent to conduct a performance test and site-specific test plan to ORCAA at least 30 calendar days before the scheduled date of a performance test. The test plan shall describe the proposed source test methods, operational conditions proposed for the test, and provisions for monitoring source operation during the test.
   - **b.** Testing shall be conducted using one of the following:
     - **i.** Approved EPA methods from 40 CFR parts 51, 60, 61 and 63.
     - **ii.** Approved procedures contained in "Source Test Manual – Procedures for Compliance Testing," State of Washington, Department of Ecology.
     - **iii.** An alternative method approved by ORCAA.
   - **c.** Carbon Monoxide (CO) shall also be measured using EPA-approved test methods or alternative methods approved by ORCAA to ensure that measured CO and NOx emissions from the emission units are representative of typical operations and proper combustion practices.
   - **d.** In lieu of stack testing and with ORCAA's approval, manufacturer test results may be used as emission unit-specific emission factors for an engine if the owner or operator can demonstrate that the engine has been maintained per manufacturer specifications for the life of the engine and manufacturer testing was conducted in accordance with EPA-approved test methods.
   - **e.** The owner or operator shall monitor all emission-related process parameters during the duration of the test.
   - **f.** Unless otherwise approved by ORCAA in advance of testing:
     - **i.** The company conducting the testing shall be certified as an Air Emissions Test Body (AETB) per ASTM D 7036-04; and,
     - **ii.** The testing shall be overseen and supervised on site by at least one Qualified Individual who is identified by the AETB as meeting the requirements described in ASTM D 7036-04 "Standard Practice for Competence of Air Emission Testing Bodies."
   - **g.** The permittee shall submit a performance test report to ORCAA no later than 45 days after completion of the test. The performance test shall be signed by a

Qualified Individual[5] from the testing company and certified as true and accurate by the Responsible Official[6] for the permittee. At a minimum, the performance test report shall contain the following information:

- **i.** A description of the source and sampling location;
- **ii.** The date and time of each test;
- **iii.** A summary of test results reported in units and averaging period appropriate to the applicable limit;
- **iv.** A description of the test methods and quality assurance procedures used;
- **v.** Operating parameters of the emission units and control equipment during each test;
- **vi.** Raw field data and sample calculations; and
- **vii.** Deviations from approved test plans.

[Regulatory Basis: WAC 173-400-091; ORCAA 1.5(i); ORCAA 6.1.12]

5. **Hour Meter Requirements:** All emergency engines shall be equipped with an operable, non-resetting hour meter.
   [Regulatory Basis: WAC 173-400-091(3); ORCAA 6.1.12(c)]

6. **Fuel Use Monitoring:** The permittee shall monitor fuel use (in standard cubic feet or gallons, as applicable) on a monthly basis for all boilers. If necessary, natural gas usage in units of therms shall be converted to standard cubic feet using the relative heating value provided by the supplier.
   [Regulatory Basis: WAC 173-400-091(3); ORCAA 6.1.12(c)]

7. **Required Records:** The following records shall be maintained for at least five years from the date the record originated, or as specified, and made available for inspection upon request:
   - **a.** Records of monthly and consecutive 12-month NOx emission calculations as required by Condition #2 or Condition #3;
   - **b.** Purchase invoices indicating the supplier, date, quantity, grade, and sulfur content (diesel only) of all fuels used to fire the engines and the boilers; and
   - **c.** Copies of all test plans and reports.

   [Regulatory Basis: WAC 173-400-091(3); ORCAA 6.1.12(c)]

8. **Emissions Reporting:** When requested, the owner or operator shall submit an annual inventory of actual emissions to ORCAA. Emissions estimates shall be based on actual operating data and ORCAA-approved emission factors. The inventory shall be submitted within thirty (30) days after receipt of the standard inventory reporting forms provided

[5]A person who is identified by the AETB as meeting the requirements described in ASTM D 7036-04 "Standard Practice for Competence of Air Emission Testing Bodies."
[6] As defined in WAC 173-401-200

by ORCAA each year. The inventory shall be accompanied by all calculations and data used in estimating emissions.
[Regulatory Basis: ORCAA 8.11; ORCAA 4.3(c); WAC 173-400-105(1)]

9. **Excess Emissions Reporting:** The permittee shall notify ORCAA within 30 days of discovering either:
    a. An exceedance of the 99 tpy NOx emission limit outlined in Condition #1; or
    b. An exceedance the 80 tpy threshold outlined in Condition #3.

    [Regulatory Basis: ORCAA 6.1.12(c)]

ATTACHMENTS

☐ APPLICABLE AIR REGULATIONS AND STANDARDS
☒ LIST OF ABBREVIATIONS AND ACRONYMS
☒ EMISSION CALCULATIONS
☐ AMBIENT AIR QUALITY ANALYSIS
☐ AIR TOXICS ANALYSIS
☐ OTHER SUPPORTING INFORMATION

Attachment 1
Abbreviations and Acronyms

Abbreviations and Acronyms

AOP	Air Operating Permit
AP-42	Compilation of Emission Factors, AP-42, Fifth Edition, Volume I, Stationary Point and Area Sources – Published by EPA
ASIL	Acceptable Source Impact Level pursuant to Chapter 173-460 WAC
BACT	Best Available Control Technology
FCAA	Federal Clean Air Act
CAM	Compliance assurance monitoring (40 CFR 64)
CFR	Code of Federal Regulations
CO	Carbon monoxide
EPA	United States Environmental Protection Agency
GACT	Generally Achievable Control Technology
HAP	Hazardous air pollutant listed pursuant to Section 112 FCAA
MACT	Maximum Achievable Control Technology
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NAAQS	National Ambient Air Quality Standard
NO_X	Nitrogen oxides
NOC	Notice of Construction application
NSPS	New Source Performance Standards
NSR	New Source Review
ORCAA	Olympic Region Clean Air Agency
PM	Total particulate matter (includes both filterable particulate matter measured by EPA Method 5 and condensable particulate matter measured by EPA Method 202)
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LEAR Clearinghouse
RCW	Revised Code of Washington
SO_2	Sulfur Dioxide
SQER	Small Quantity Emission Rate listed in Chapter 173-460 WAC
TAP	Toxic Air Pollutant pursuant to Chapter 173-460 WAC
T-BACT	Best Available Control Technology for toxic air pollutants
VOC	Volatile Organic Compound
WAC	Washington Administrative Code

Units of Measurement

‘	minute (measurement of angle)
‘’	second (measurement of angle)
°	degree
acfm	actual cubic feet per minute
atm	atmosphere
Bhp	Brake horsepower
Btu	British thermal units
cfm	cubic feet per minute
dscfm	dry standard cubic feet per minute
°F	degree Fahrenheit
ft	feet
g	grams
g/s	grams per second
gal	gallon
gr	grain
hr	hour
hp	horsepower
in	inches
K	degree Kelvin
kg	kilograms
km	kilometers
kW	kilowatt
L	liter
lb	pounds
m	meters
M	thousand
min	minute
Mbf	thousand board feet
MMbf	million board feet
MM	million
µg	micrograms
MMBtu	million British thermal units
mmHg	millimeters of mercury
mph	miles per hour
MW	megawatts
ppm	parts per million
ppmvd	parts per million, dry volume
ppb	parts per billion
psi	pounds per square inch
s	second
scfm	standard cubic feet per minute
tpy	tons per year

Attachment 2
Emission Calculations

Potential emissions from the boilers and emergency engines were generally calculated as follows:

$$PTE = EF \times PR \times T$$

Where:
$PTE = Potential\ to\ Emit\ for\ a\ pollutant$
$EF = Emission\ Factor\ for\ pollutant$
$PR = Physcal\ or\ operational\ design\ rate$
$T = Operating\ time$

Below is an example of NOx PTE emission calculations:

Boilers

$$NOx\ PTE\ in\ lbs/yr = \frac{20\ lbs}{1{,}000\ gallons\ diesel} \times FC \times T$$

$where$:
$FC = Fuel\ oil\ consumption\ reviewed\ under\ 10NOC751\ in \frac{gal}{hr}$
$T = 8{,}760\ hr/yr$

Emergency Engines EU4-EU9

$$NOx\ PTE\ in \frac{lbs}{yr} = \frac{0.024\ lbs}{HP - hr} \times HP \times T$$

$where$:
$HP = Rated\ horsepower\ of\ the\ engine$
$T = 500\ hr/yr$

For engines EU10-EU15

$$NOx\ PTE\ in \frac{lbs}{yr} = \left(\frac{6.12\ g}{kW - hr}\right) \times kW \times T \times \frac{1\ lb}{453.59\ g}$$

$where$:
$kW = Rated\ engine\ power\ expressed\ in\ kilowatts$
$T = 500\ hr/yr$