

Scenario 02: T2 Emergency Genset EU-013 - 1-hr NO2 NAAQS (Scaled to 500 hours)

Wednesday, July 20, 2022 12:15 PM

Scenario Info

Casino

- ID: CASINO
- Base Elevation: **1475** ft (= 449.6 m) (Estimated from USGS National Map and Google Earth)
- Tiers of Current Building
 - o **70** ft (= 21.34 m) (Estimated from USGS National Map and Google Earth)
- Type: Polygonal

#	X Coord [m]	Y Coord [m]
1	681809.89	4285089.16
2	681802.34	4285015.81
3	681830.66	4284987.37
4	681952.95	4285020.58
5	681884.64	4285119.63

Parking Garage

- ID: PARKING
- Base Elevation: **1460** ft (= 445.0 m) (Estimated from USGS National Map and Google Earth)
- Tiers of Current Building: 7 stories
 - o **60** ft (= 18.29 m) (Estimated from USGS National Map and Google Earth)
- Type: Polygonal

#	X Coord [m]	Y Coord [m]
1	681901.38	4285118.45
2	682021.39	4284988.28
3	682066.36	4285038.83
4	681951.85	4285167.80

New Hotel

- ID: HOTEL
- Base Elevation: **1480** ft (= 451.1 m) (Estimated from USGS National Map and Google Earth)
- Tiers of Current Building: 5 stories
 - o **40** ft (= 12.19 m) (Estimated based on a typical 5-story building)
- Type: Polygonal

#	X Coord [m]	Y Coord [m]
1	681814.91	4284953.03
2	681811.53	4284868.56
3	681829.71	4284838.66
4	681845.89	4284831.04
5	681864.71	4284841.68
6	681846.90	4284855.71

7	681837.73	4284887.48
8	681839.21	4284956.25

Existing Engines

- Model: Cummins 2000DQKAB Emergency Generator
- Power Output: 2922 bhp
- Heat Input: 18.62 MMBTU/hr
- NO_x emissions: 5.57 tpy

Engine #	X Coord [m]	Y Coord [m]
1	681887.92	4285143.69
2	681889.59	4285139.28
3	681891.88	4285134.45

Source Used for Run:

- Source ID: NE_500
- X-Coordinate: **681809.94** m (Estimated from Site Map in the application package)
- Y-Coordinate: **4284934.60** m (Estimated from Site Map in the application package)
- Release Stack Height: **2.516 m (= 8.25 ft)**
 - o Engine exhausts are at 2516 mm (= 99.1 inches) above the bottom of the engine, based on the manufacturer's dimension drawing.
- Base Elevation: **1480** ft (= 451.1 m) (Estimated from USGS National Map and Google Earth)
- Release Type: Vertical Stack
- Emission Rate: **1.205** lb/hr (= 0.1518 g/s)
 - o Emission Factor: **21.10** lb/hr (= 2.6590 g/s) NO_x
 - NO_x: 5.47 g/kW-hr (from the EPA Certification of Engine Certificate # MMVXL65.4BBA-018)
 - (5.47 g/kW-hr) * (1750 kW) * (1 lb/ 453.59 g) = 21.104 lb/hr
 - (5.47 g/kW-hr) * (1750 kW) * (1 hr/ 3600 s) = 2.6590 g/s
 - o Scaled emission rate:
 - (21.104 lb/hr) * (500 hr / 8760 hr) = 1.205 lb/hr
 - (2.6590 g/s) * (500 hr / 8760 hr) = 0.1518 g/s
 - Scaling for 500 hour of operation per year instead of 8,760 hours.
- Fixed
- Plume Exit Temperature: **505** deg C (= **941** deg F = **778.15** K)
- Stack Inside Diameter: **0.480** m (= 18.90 in) (based on the manufacturer's dimension drawing)
- Plume Exit Flow Rate: **15642** ft³/min (from Manufacturer's Performance Data)
- Plume Exit Velocity: **133.84** ft/s (= 40.795 m/s)
 - o Auto-populated

Source Scenario Inputs

- Dispersion: Urban
- Population: **784**
- No Debug File
- Pollutant Emission Rate:
 - o **1.205** lb/hr NO₂ (= 0.1518 g/s) (with Chemistry)
 - OLM
 - In-Stack NO₂/NO_x Ratio: 0.50
 - Ozone Concentration: **6.0** ppb

□ Annual NO₂ Site-Level 2021 Design Values for **Roseville-N Sunrise Ave (060610006)**

- Downwash: Include all Buildings (CASINO, PARKING, HOTEL)
- Meteorology Parameters
 - Min Temp: -9.67 deg F (= 250.0 K)
 - Max Temp: 116 deg F (= 319.8 K)
 - Min Wind Speed: 0.5 m/s
 - Anemometer Height: 10.0 m
 - Do NOT adjust friction velocity
- Surface Characteristics (Deciduous Forest, dry, annual average):
 - Condition: Dry
 - Land Use Type: Deciduous Forest
 - Season: Annual Average
 - Albedo: **0.215**
 - Bowen Ratio: **1.525**
 - Surface Roughness: **0.90 m**
- NO AERMET Seasonal Tables
- NO External File
- Include Terrain Effects and Force AERMAP Re-Run
 - Map Type: USGS DEM/CDED
- Source Base Elevation: **1480** ft (= 451.1 m) (Estimated from USGS National Map and Google Earth)
- NO Flagpole Receptors
- Minimum Distance to Ambient Air (Distance from Source to Fence): 1.0 m
- Maximum Distance of Downwind Receptors (Probe Distance): 10.0 km
- NO Additional Receptors
- Do NOT apply inverse break-up fumigation
- Do NOT apply shoreline fumigation