

APPENDIX M AIR QUALITY TECHNICAL ANALYSIS

For the proposed project, the Clean Air Act general conformity applies to emissions of pollutants and precursor pollutants for which Nassau County is designated as nonattainment or maintenance. Nassau County is a serious nonattainment area for the 2008 8-hour ozone standard, moderate nonattainment for the 2015 8-hour ozone standard, and a maintenance area for the 1971 maximum carbon monoxide (CO) and 2006 24-hour average fine particulate matter (PM_{2.5}) standards (EPA 2020). Nassau County is an attainment area for the remaining criteria pollutants; therefore, general conformity requirements do not apply to other criteria pollutants in the study area and a *de minimis* evaluation is not necessary.

Table M-1 shows the applicable *de minimis* thresholds for each pollutant (the term “precursor” in the table refers to the pollutants). A general conformity determination would not be required if an applicability analysis shows the emissions of the proposed project during construction and operation would not exceed the *de minimis* thresholds.

Table M-1: Applicable General Conformity *de minimis* Thresholds (for Pollutants for which Nassau County Is Designated as Nonattainment or Maintenance)

Pollutant	Type	<i>De minimis</i> Threshold (tons/year)	Nassau County Attainment Status
Carbon monoxide	Direct emissions of CO	100	Maintenance area for 1971 1-hour and 8-hour standards
Volatile organic compounds	Ozone precursor	50	Non-attainment for 2008 and 2015 8-hour ozone standards
Nitrogen oxide	Ozone precursor and PM _{2.5} precursor	100	
PM _{2.5}	Direct emissions of PM _{2.5}	100	Maintenance area for 2006 24-hour average PM _{2.5} standard
Sulfur dioxide	PM _{2.5} precursor	100	

CONSTRUCTION

Construction activities would result in short-term emissions of criteria pollutants from off-road, heavy-duty construction equipment (e.g., backhoes, excavators, HDD drillers, and graders), haul trucks, construction worker commutes, tugboat operation, and fugitive dust. Based on the attainment status of Nassau County, a general conformity emissions analysis was prepared for nitrogen oxide (NO_x), volatile organic compounds (VOC), and PM_{2.5}. Diesel equipment and vehicles emit substantially less sulfur dioxide (SO₂) when compared to direct PM_{2.5} emissions, and, consequently, the PM_{2.5} precursor SO₂ was not analyzed. (As indicated in **Table M-2** below, EPA’s National Emissions Inventory data for New York State show that SO₂ emissions from highway vehicles are 22 percent of PM_{2.5} emissions from highway vehicles (EPA 2014). Therefore, if the general conformity *de minimis* threshold is not exceeded for PM_{2.5} direct emissions, it cannot be exceeded for SO₂).

Table M-2: New York State Highway Vehicle Emissions

Pollutant	Emissions in Tons
PM _{2.5}	6,806.86
Sulfur Dioxide	1,486.49

Emissions were quantified using the Motor Vehicle Emission Simulator (MOVES2014b) model for haul truck and worker commute emissions, the NONROAD model for off-road equipment, and EPA AP-42 procedures for quantifying fugitive dust emissions (EPA 1995).¹ Assumptions regarding equipment requirements, workers, truck trips, and the quantity of soil to be moved were developed for the analysis.

Table M-3 summarizes the construction emission analysis results. The general conformity *de minimis* thresholds would not be exceeded.

Table M-3: 2021 Peak Construction Year Emissions Summary (Tons)

	CO	NO _x	VOC	PM _{2.5}
Off-road heavy equipment	1.3	2.5	0.3	0.2
On-road haul trucks and worker commutes	0.9	3.8	0.2	0.2
Fugitive dust	NA	NA	NA	0.4
Barge Tug	8.0	11.1	1.5	0.3
Total	10.1	17.5	2.0	1.0
General conformity <i>de minimis</i> threshold	100.0	100.0	50.0	100.0
<i>De minimis</i> threshold exceeded?	No	No	No	No

Note: The construction impact analysis incorporates 2018 emissions factors. 2020 emissions factors would be lower, because vehicle fleet mix and equipment incrementally improve each year. As such, use of 2018 emissions factors presents a conservative analysis.

OPERATION

Mobile Sources

The proposed project would not result in substantial new vehicle trips or result in changes to traffic patterns. Therefore, a mobile source air quality impact analysis for the direct impacts of the proposed project is not necessary.

Wastewater Treatment

The proposed project would not result in a net increase in wastewater treatment that would generate emissions. Instead, wastewater would be transported to a different location and undergo treatment. Therefore, an analysis of stationary air quality impacts for wastewater treatment is not necessary.

¹ To present a conservative assessment of auto emissions, haul truck emission factors were used.

Diversion Pump Station

Electricity: The proposed project would entail a diversion pump station that would have a design flow of 17 million gallons per day (mgd). The station is expected to comprise four pumps – two large pumps (17 mgd) for peak (wet weather) water flow conditions (one operational, one back up); and two small pumps (6.5 mgd) for low/average (dry weather) flow conditions (one operational, one back up). The large pumps would have 720 horsepower, while small pumps would have 54 horsepower. A new commercial electric normal supply would be provided by PSE&G Long Island; therefore, no stationary source emissions related to fuel combustion would occur under normal conditions (see the section on backup generator below for information on emergency backup power).

At any one time, only one pump would be running, depending on weather conditions. Conservatively assuming operation of the larger pump during one-third of the year, and the smaller pump during the remainder of the year, operation of the diversion pump station would result in a net 1,134.04 metric tons of CO₂e. When adding in the standby backup generator emissions (below), the proposed project would result in 1,448.84 metric tons of CO₂e emissions per year.

Standby Backup Generator: Pursuant to 90% design specifications, one 1250-kilowatt (kW) (1,676 horsepower) diesel backup generator is assumed for the diversion station.

The annual emissions of backup power generator, based on up to 500 hours of operation (up to approximately 20 days of power outages plus 2 hours of testing each month), were estimated based on their approximate horsepower, fuel type, and EPA’s AP-42 (see **Table M-4**). The results of the emergency generator analysis demonstrate that emissions would be below the general conformity *de minimis* criteria.

Satellite Pump Stations

The satellite pump stations would continue to operate as under existing conditions. The proposed project would not result in increased wastewater flows, and electricity demand would not increase. Existing generators at the pump stations would continue to operate for regular testing and during power outages as they do under existing conditions. No net new emissions would occur.

Table M-4: Emergency Backup Generator – Emissions Estimate

Pollutant	Emission Factor (lbs/hp-hr)	Source	Emissions @500 hrs/year (lbs)	Annual Emissions in metric tons
NO _x	0.031	AP-42 Table 3.3-1	25,978	11.78
VOC	0.0025141	AP-42 Table 3.3-1 (TOC- exhaust plus crankcase)	2,107	0.96
SO _x	0.00205	AP-42 Table 3.3-1	1,718	0.78
PM	0.0022	AP-42 Table 3.3-1	1,844	0.84
CO	0.00668	AP-42 Table 3.3-1	5,598	2.54
CO ₂	1.15	AP-42 Table 3.3-1	963,700	437.13

REFERENCES

U.S. Environmental Protection Agency (EPA)

- 1995 EPA Compilation of Air Pollutant Emission Factors (AP-42), Section 4.3 Waste Water Collection, Treatment and Storage. Available at <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors>.
- 1997 AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources. Available at <https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emission-factors>.
- 2014 National Emissions Inventory (NEI) Data. Data Query, Tier 1 Summary: New York State--SO2 and PM2.5 Highway. Available at <https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data>. Accessed March 21, 2020.
- 2015 Air Quality Design Values. Available at <https://www.epa.gov/air-trends/air-quality-design-values>.
- 2020 Green Book: New York Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Available at https://www3.epa.gov/airquality/greenbook/anayo_ny.html. Accessed February 14, 2020.