Kornak, Kate F (DEC)

From:	Knight, Prince <Prince.Knight@Tradebe.com>
Sent:	Thursday, April 16, 2020 12:59 PM
To:	Kornak, Kate F (DEC); Prunier, Denise (DEC); Potter, Benjamin J (DEC); DeSantis, Steve (DEC); Schmitt, Victoria M (DEC); Hadersbeck, Joseph E (DEC)
Cc:	Maguffin, David; LaGrimas, Tita; Nusimovich, Ivan; Brian Noel; Simone Wallace
Subject:	Norlite, LLC - DEC ID: 4-0103-00016 - Air Modeling Report - Project Delta
Attachments:	Norlite_Modeling Report 2020-0331.pdf

Good Afternoon Ms. Kornak,

Please find attached the Final Air Modeling Report required by Norlite's Current Title V permit for the Project Delta Modifications. The report was prepared by Trinity Consultants. They will be supplying the CD and supporting electronic files separately. If hard copies of the report are needed, please let us know and we can have them prepared. Otherwise, this will be the only submission of the report.

Please contact us if there are any questions.

Sincerely,

Knight, Prince
Environmental & Regulatory Compliance Manager
Tradebe Environmental Services, LLC

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TRADEBE

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION - PROJECT DELTA MODELING REPORT

Norlite, LLC
A Division of Tradebe Environmental Services, LLC
Cohoes, NY

Prepared For:

Norlite, LLC
DEC ID: 4-0103-00016

Prepared By:

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April 2020

Environmental solutions delivered uncommonly well

1. INTRODUCTION

On behalf of Norlite, LLC, a division of Tradebe Environmental Services, LLC (Norlite), Trinity Consultants, Inc. (Trinity) is submitting this modeling report to the New York State Department of Environmental Conservation (NYSDEC). Norlite operates two hazardous waste-burning lightweight aggregate rotary kilns and accepts off-site liquid waste for energy recovery at their facility in the city of Cohoes, Albany County, New York. The facility is classified as a major source for hazardous air pollutants (HAPs) and certain criteria pollutants which subjects the facility to the Title V permit process. Operations at this facility are authorized under a Title V Operating Permit 4-0103-00016/00048, Mod 6, issued on October 7, 2019 and a Part 373 permit 4-0103-00016/00016 which went into effect on January 1, 2016.

1.1. PROJECT DESCRIPTION

Located in the city of Cohoes, NY at 628 South Saratoga Street, Norlite is bordered by residential areas and commercial operations. The facility manufactures lightweight, porous ceramic material produced by expanding and vitrifying select shale in two rotary industrial furnaces. The fuel source for kiln heating is an alternate fuel source made up of spent solvents and petroleum products from various industrial sources. Norlite has been engaged in a two to three year project (Project Delta) to upgrade the Air Pollution Control (APC) equipment associated with both kilns. Once fully implemented, Project Delta will replace the two existing venturi-based wet scrubbers with two new semi-dry technology scrubbers employing hydrated lime as the sorbent material.

As required as part of the air permit application submitted in 2018 and to satisfy condition 6-2 of the Mod 6 permit, the following air dispersion modeling analysis was required:

- 6 New York Codes, Rules and Regulations (CRR-NY) Part 212: Part 212 applies to process emission sources (non-combustion sources) associated with a process operation upon issuance of a new, modified, or renewal permit/registration for a facility;
- A Toxic Impact Assessment required for High Toxicity Air Contaminants (HTACs) emitted from sources subject to National Emission Standards for Hazardous Air Pollutants (NESHAPs) as required by § 212-1.5(e)(2);
- National Ambient Air Quality Standards (NAAQS) compliance evaluation for criteria pollutants; and
- Unitized modeling analysis comparison for proposed scrubbers and existing scrubbers.

Norlite's modeling protocol was approved by NYSDEC on February 12, 2019.

The remainder of this modeling report is organized as follows:

- Section 1 provides a brief description of the facility and the project;
- Section 2 lists NYSDEC standards that apply to the proposed project;
- Section 3 describes the choice of air dispersion model, modeling procedures, meteorological data, and methodology for analyzing building downwash, terrain, and other model parameters; and,
- Section 4 provides the model results with comparison to the Annual/ Short-term Guideline Concentrations (AGC/SGC), NAAQS, and Unit Analysis.

The proposed modeling methods described in this modeling protocol are consistent with United States (U.S.) Environmental Protection Agency's (EPA's) User's Guide for the EPA Regulatory Model – AERMOD (AERMOD User's Guide)[1], New York State Division of Air Resources (DAR) DAR-1 titled "Guidelines for the Evaluation and

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[1] U.S. EPA, User's Guide for the AMS/EPA Regulatory Model – AERMOD, EPA-454/B-19-027, August 2019.

Control of Ambient Air Contaminants under Part 212" [2], and DAR-10 titled "NYSDEC Guidelines on Dispersion Modeling Procedures for Air Quality Impact Analysis"[3].

1.2. SITE DESCRIPTION

Norlite Facility is located in Cohoes, NY (Albany County). Figure 1-1 presents an aerial map of the existing Norlite Facility. A site layout is included in Attachment A.

The facility is located at the following address:

628 Saratoga St,
Cohoes, NY 12047

Following is the contact information for Norlite:

Air Permit Contact

Prince Knight
Environmental & Regulatory Compliance Manager
628 Saratoga St,
Cohoes, NY 12047
Office Phone: (518) 235-0401

Facility Contact

David Maguffin
Plant Manager
Office Phone: (518) 235-0401

[2] NYSDEC DAR-1 Guidance: http://www.dec.ny.gov/docs/air_pdf/dar1.pdf

[3] NYSDEC DAR-10 Guidance: http://www.dec.ny.gov/docs/air_pdf/dar10.pdf

Figure 1-1. Aerial Map of Norlite

The objective of this modeling analysis is to show compliance of Norlite's operations with NAAQS and Part 212 requirements.

2.1. CRITERIA POLLUTANT MODELING

The emissions of criteria pollutants associated with Project Delta were modeled to show that this project does not result in offsite impacts which exceed the NAAQS. The NAAQS are the maximum concentration ceilings, measured in terms of total concentration of a pollutant in the atmosphere, which define the "levels of air quality which the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health".[4] The NAAQS addressed in this air dispersion modeling analysis are shown in Table 2-1.

Table 2-1. Applicable NAAQS for Criteria Air Pollutants

Pollutant	Averaging Period	NAAQS ($\mu g/m^3$)
CO	1-hour	40,000 (35 ppm)[1]
	8-hour	10,000 (9 ppm)[1]
SO_2 [3]	1-hour	196 (0.075 ppm)[2]
	3-hour	1,300 (0.5 ppm)
	24-hour	365 (0.14 ppm)
	Annual	80 (0.03 ppm)
NO_2	1-hour	188 (100 ppb)[5]
	Annual	100 (0.053 ppm)[4]
PM_{10}	24-hour	150[6]
$PM_{2.5}$	24-hour	35[7]
	Annual	12[8]

1 Not to be exceeded more than once per year.
2 The 3-year average of the 99th percentile of the daily maximum 1-hr average.
3 Effective August 23, 2010 U.S. EPA revoked the 24-hr and Annual SO_2 NAAQS (75 FR 35520, *Primary National Ambient Air Quality Standards for Sulfur Dioxide*, June 22, 2010), however, they remain in place until the state implementation plans are approved.
4 Annual arithmetic average.
5 The 3-year average of the 98th percentile of the daily maximum 1-hr average.
6 Not to be exceeded more than once per year on average over a 3-year period.
7 The 3-year average of the 98th percentile 24-hour average concentration.
8 The 3-year average of the annual arithmetic average concentration.

[4] 40 CFR §50.2(b).

The sum of the facility's maximum modeled concentration and the background concentration were evaluated against NAAQS and are presented in Section 4. This criteria pollutant analysis was evaluated for emission sources which may be impacted by Project Delta, pollutants, averaging periods, and emission rates as included in Table 2-2. The background concentrations can be found in Table 2-3.

Table 2-2. Criteria Pollutant Emission Rates

AERMOD ID	Description	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)		NO_2 (lb/hr)	SO_2 (lb/hr)	CO (lb/hr)
		Short-Term	Long-Term	Short-Term			
New_SCB1	New Scrubber for Kiln #1	5.94	4.48	4.48	22.4	28.0	1.67
New_SCB2	New Scrubber for Kiln #2	5.94	4.48	4.48	22.4	28.0	1.67
CC1_New	Clinker Cooler #1	4.94	2.35	2.35	--	--	--
CC2_New	Clinker Cooler #2	4.94	2.35	2.35	--	--	--
FPC	Finishing Plant Crusher	0.33	0.08	0.22	--	--	--
PSH_New	Shale Storage Silo	6.01E-03	2.13E-04	9.10E-04	--	--	--
KFR_1new	New Rim Seal & Loading Location Kiln 1	1.76E-03	2.66E-04	2.66E-04	--	--	--
KFR_2new	New Rim Seal & Loading Location Kiln 2	1.76E-03	2.66E-04	2.66E-04	--	--	--

Table 2-3. Background Concentrations

Pollutant	Averaging Period	Monitor Background Concentration (μg/m³)	Metric	Source	Monitor Location
NO_2	1-hour	65.50	3-yr average of 98th percentile	EPA AirData	AQS Site ID 50-021-0002 (Rutland VT)
	Annual	14.14	Maximum annual average from the last three years	EPA AirData	AQS Site ID 50-021-0002 (Rutland VT)
SO_2	1-hour	13.02	3-yr average of 99th percentile	NYSDEC 2017 Air Quality Report	AQS Site ID 36-001-0012 (Loudonville NY)
	3-hour	13.02	Not to be exceeded more than once per calendar year	Conservative Assumption based on 1-hour standard	AQS Site ID 36-001-0012 (Loudonville NY)
	24-hour	13.02	Not to be exceeded more than once per calendar year	Conservative Assumption based on 1-hour standard	AQS Site ID 36-001-0012 (Loudonville NY)
	Annual	3.40	Maximum annual average from the last three years.	NYSDEC 2017 Air Quality Report	AQS Site ID 36-001-0012 (Loudonville NY)
$PM_{2.5}$	24-hr	15.9	98th percentile averaged over the last three years	NYSDEC 2017 Air Quality Report	AQS Site ID 36-001-0012 (Loudonville NY)
	Annual	6.1	Annual average, averaged over the last three years	NYSDEC 2017 Air Quality Report	AQS Site ID 36-001-0012 (Loudonville NY)
PM_{10}	24-hour	35	Maximum second maximum value over the last three years.	EPA AirData	AQS Site ID 50-021-0002 (Rutland VT)
CO	1-hour	343.5	Maximum second maximum value over the last three years.	NYSDEC 2017 Air Quality Report	AQS Site ID 36-001-0012 (Loudonville NY)
	8-hour	229.0	Maximum second maximum value over the last three years.	NYSDEC 2017 Air Quality Report	AQS Site ID 36-001-0012 (Loudonville NY)

2.2. STATE TOXICS PERMITTING AND MODELING

The emissions from each toxic air contaminant known to be emitted from the kilns and other Part 212-subject process emission sources on site have been calculated as presented in Attachment B. For consistency, the Emissions of Toxic Air Contaminants section of Attachment B of the Project Delta Air Permit Application submitted in December 2018 is incorporated into Attachment B of this modeling protocol directly. For each of those process emission sources and compounds, an evaluation was completed to determine if modeling was required for the emission of each individual contaminant from process emission sources subject to Part 212. The evaluation included consideration of the following special cases for which modeling may not be required:

- Site-wide potential to emit (PTE) of HTAC below the Mass Emission Limit (MEL) in §212-2.2 Table 2. For compounds that meet these criteria, Part 212 is satisfied per §212-2.1(a).
  - For these compounds, no further evaluation is required under Part 212.
- HTAC regulated by an applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) for which the facility is in compliance.

- For these compounds, a Toxic Impact Assessment (TIA) must be completed illustrating that off-site impact falls below appropriate guideline concentrations and the Persistent & Bioaccumulative (PB) Trigger cannot be exceeded, per §212-1.5(e)(2).
- Non-HTAC HAP regulated by an applicable NESHAP for which the facility is in compliance.
  - For these compounds, Part 212 is satisfied per §212-1.5(e)(2).
- Non-HTAC, compounds with PTE <100 pounds per year (lb/yr).
  - For these compounds, there are no substantive Part 212 requirements as described in DAR-1.

Each compound that is required to be modeled under Part 212 and that is required to be compared to the AGC and SGC threshold in DAR-1 is listed in Table 2-4 below.

Table 2-4. New York State's SGC/AGC for Part 212 Compounds

Pollutant	Model per 212?	SGC (µg/m3)	AGC (µg/m3)
Hydrogen Fluoride	Y	5.6E+00	7.1E-02
Arsenic	TIA	--	2.30E-04
Cadmium	TIA	--	2.4E-04
Lead	TIA	--	3.8E-02
Mercury	TIA	6.0E-01	3.0E-01
1,1,1-Trichloroethane (methyl chloroform)	Y	9.0E+03	5.0E+03
Benzene	TIA	1.3E+03	1.3E-01
Carbon tetrachloride	TIA	1.9E+03	1.7E-01
Dichlorodifluoromethane	Y	--	1.2E+04
Vinyl chloride	TIA	1.8E+05	1.1E-01
1,3-Butadiene	TIA	--	3.3E-02
POM[a]	TIA	--	2.0E-02

[a] The AGC for polycyclic aromatic hydrocarbon (PAH) compounds is used for the polycyclic organic matter (POM) compounds since POM defines a broad class of compounds that include PAHs.

Norlite conducted air dispersion modeling in accordance with the approved modeling protocol to demonstrate that the maximum offsite concentration from the process emission source contaminants do not cause exceedances of the AGC and SGC presented in the table above. Results are discussed in Section 4.

This section of the modeling report describes the procedures and data resources utilized in the NAAQS and Part 212 air dispersion modeling analysis. The techniques for this air dispersion modeling analysis are consistent with the current U.S. EPA and NYSDEC guidance.

3.1. DISPERSION MODEL SELECTION AND BUILDING DOWNWASH ANALYSIS

Dispersion models predict downwind pollutant concentrations by simulating the evolution of the pollutant plume over time and space given data inputs including the quantity of emissions and the initial conditions (e.g., velocity, flowrate, and temperature) of the stack exhaust to the atmosphere. Building structures that obstruct wind flow near emission points may cause stack discharges to become caught in the turbulent wakes of these structures leading to downwash of the plumes. Wind blowing around a building creates zones of turbulence that are greater than if the building was absent. These effects generally cause higher ground-level pollutant concentrations since building downwash inhibits dispersion from elevated stack discharges. For this reason, building downwash algorithms are considered an integral component of the selected air dispersion model.

The v18081 of the AERMOD model was used to estimate maximum ground-level concentrations in the conducted dispersion analysis.[5] AERMOD is a refined, steady-state, multiple source, dispersion model and was promulgated in December 2005 as the preferred model to use for industrial sources in this type of air dispersion modeling analysis.[6] Following procedures outlined in the NYSDEC's Modeling Guidelines, the AERMOD modeling was performed using regulatory default options. The AERMOD model has the Plume Rise Modeling Enhancements (PRIME) incorporated in the regulatory version, so the direction-specific building downwash dimensions used as input to AERMOD was determined by the Building Profile Input Program, PRIME version (BPIP PRIME), version 04274.[7] BPIP PRIME is designed to incorporate the concepts and procedures expressed in the Good Engineering Practices (GEP) Technical Support document, the Building Downwash Guidance document, and other related documents,[8] while incorporating the PRIME enhancements to improve prediction of ambient impacts in building cavities and wake regions.

A site sketch showing the buildings and the property boundary is provided in Attachment A. Additional building and downwash data is included in the Modeling CD in Attachment C. Table 3-1 lists the building ID, locations, and height.

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[5] EPA released AERMOD v19191 in August 2019. However, since the protocol was approved for v18081, that version of AERMOD is used in the final analysis. In addition, there are no changes to the model formulation that would reasonably be expected to alter the analysis performed.

[6] 40 CFR 51, Appendix W–*Guideline on Air Quality Models*, Appendix A.1– AMS/EPA Regulatory Model (AERMOD).

[7] Earth Tech, Inc., ***Addendum to the ISC3 User's Guide, The PRIME Plume Rise and Building Downwash Model,*** Concord, MA.

[8] U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, *Guidelines for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) (Revised)*, Research Triangle Park, North Carolina, EPA 450/4-80-023R, June 1985.

Table 3-1. Building Locations

Modeling ID	X Coordinate (m)	Y Coordinate (m)	Elevation (m)	Height (m)
B1	606106.8	4734523.1	18.57	5.49
B2	606105.5	4734510.7	17.15	5.49
B3	606097.2	4734451.9	14.25	5.49
B4	606070.6	4734433.8	20.67	12.19
B5	606071.0	4734448.2	21.04	6.10
B6	606054.8	4734433.2	20.99	7.01
B7	606046.7	4734427.8	20.57	5.79
B8	606051.3	4734393.1	17.76	3.66
B9	606042.0	4734392.9	17.39	2.74
B10	606115.9	4734415.2	13.96	4.27
B11	606113.4	4734382.6	15.88	3.35
B12	605949.6	4734223.5	18.04	11.89
B13	606166.2	4734229.7	10.82	15.85
B14	606029.0	4734196.3	14.33	4.88
B15	606030.7	4734196.1	14.13	7.92
B17	606060.7	4734256.8	13.56	4.57
B18	606050.1	4734283.7	15.23	8.53
B19	606049.6	4734271.2	14.86	10.06
B20	606073.3	4734300.0	11.85	3.96
B22	606213.7	4734306.2	9.42	9.14
B23	606026.6	4734266.1	17.90	26.52
B24	606066.6	4734298.2	12.33	12.19
B25	606062.0	4734298.5	12.97	12.19
B26	606031.9	4734288.8	17.74	18.29
APC_	606029.5	4734288.9	17.89	27.00
STRG	606021.3	4734241.5	17.58	4.88

3.2. TREATMENT OF TERRAIN

Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.[9]

Receptor, building and source terrain elevations input to the model were interpolated from 1/3 arc-second National Elevation Dataset (NED) data obtained from the U.S. Geological Survey (USGS) from datum year 1983. The array elevations were interpolated using the version 18081 of AERMAP. AERMAP searches all NED points for the terrain height and location that has the greatest influence on each receptor to determine the hill height scale for that receptor.

[9] EPA, *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, EPA-454/B-03-003, Research Triangle Park, NC.

3.3. METEOROLOGICAL DATA

Site-specific dispersion models require a sequential hourly record of dispersion meteorology representative of the region within which the source is located. In the absence of site-specific measurements, the U.S. EPA guidelines recommend the use of readily available data from the closest and most representative National Weather Service (NWS) station. Regulatory air dispersion modeling using AERMOD requires five years of quality-assured meteorological data that includes hourly records of the following parameters:

- Wind speed;
- Wind direction;
- Air temperature;
- Micrometeorological parameters (e.g., friction velocity, Monin-Obukhov length);
- Mechanical mixing height; and
- Convective mixing height.

The first three of these parameters are directly measured by monitoring equipment located at typical surface observation stations. The friction velocity, Monin-Obukhov length, and mixing heights are derived from characteristic micrometeorological parameters and from observed and correlated values of cloud cover, solar insulation, time of day and year, and latitude of the surface observation station. Surface observation stations form a relatively dense network, are almost always found at airports, and are typically operated by the NWS. Upper air stations are fewer in number than surface observing points since the upper atmosphere is less vulnerable to local effects caused by terrain or other land influences and is therefore less variable. The NWS operates virtually all available upper air measurement stations in the United States.

Trinity utilized the AERMOD-ready five years of meteorological data (2013-2017) from the Albany Airport NWS station provided by the NYSDEC.[10], the Albany station is located roughly 8.5 km west of Norlite facility. The meteorological data was processed by the NYSDEC using AERMET version 18081 to include upper air measurements from the Albany, NY NWS site (upper air station ID No. 54775).

3.4. COORDINATE SYSTEM

In all modeling analysis data files, the location of emission sources, structures, and receptors, are represented in the Universal Transverse Mercator (UTM) coordinate system. The UTM grid divides the world into coordinates that are measured in north meters (measured from the equator) and east meters (measured from the central meridian of a particular zone, which is set at 500 km). The datum for this modeling analysis is based on North American Datum 1983 (NAD 83). UTM coordinates for this analysis all reside within UTM Zone 18.

3.5. RECEPTOR GRIDS

For this air dispersion modeling analysis, ground-level concentrations are calculated along the fence line and also within a Cartesian receptor grid. As per DAR-10 guidance, the dispersion model should consider both simple and complex terrain receptor impacts. As such, a Cartesian receptor grid as detailed in Section 3.5.1 was used.

3.5.1. Cartesian Receptor Grid

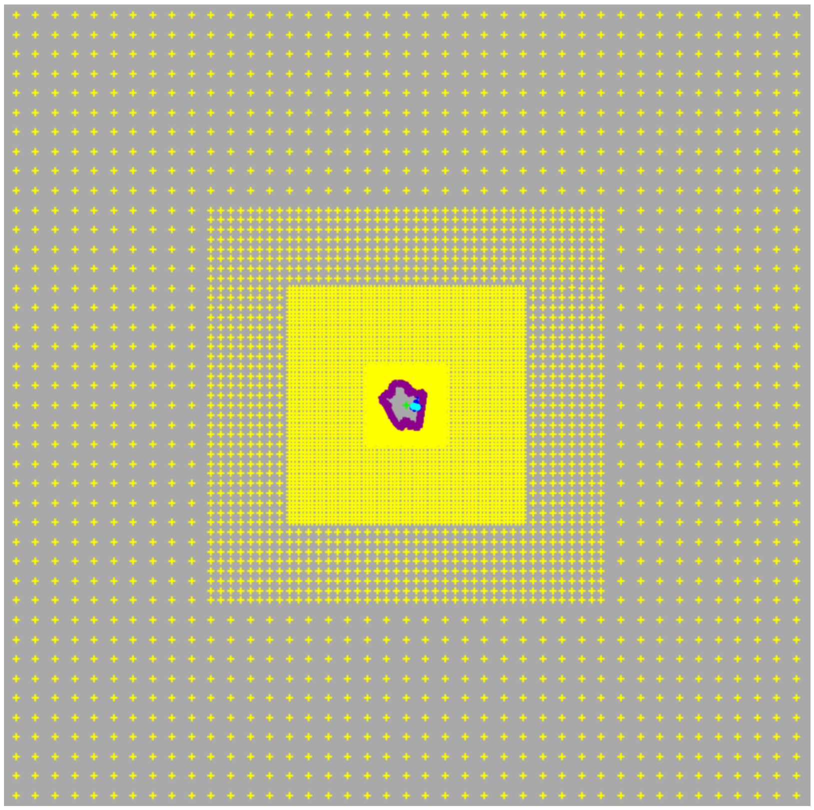
- 50 meter-spaced receptors covering a region that extends until 1 km from the facility;
- 100 meter-spaced receptors covering a region from 1 km to 2.5 km from the facility;

[10] Meteorological Data provided by Julia Stuart (NYSDEC) on August 22, 2018.

- 250 meter-spaced receptors covering a region from 2.5 km to 5 km from the facility; and
- 500 meter-spaced receptors covering a region from 5km to 10 km from the facility.

The receptor grid is presented in Figure 3-1.

Figure 3-1. Facility Receptor Grid



3.5.2. Fence Line Receptors

Receptors were placed along the length of the property line spaced at 25-meter-intervals. The fence line is shown in Figure 3-2 as the purple outline.

Figure 3-2. Facility Fence line

3.5.3. Sensitive Receptors

In evaluating the surrounding 2 km area of the Norlite facility in Google Earth™, Trinity did not visually locate any hospitals within this area. However, there are several residences within this area. In addition, both schools and nursing homes that may be considered sensitive receptors were identified within the 2 km area. Those that were identified are listed below. The tightly-spaced receptor grid near the facility will represent the ambient model concentration for the neighborhoods in this area.

Schools within this area are as follows:

- Heatly School
- Watervliet Elementary School
- Abram Lansing School
- Cohoes Middle School
- Cohoes High School
- Harmony Hill School
- Page Avenue Elementary School
- Troy School

- Van Schaick Island School
- Maplewood School

Nursing homes within this area are as follows:

- OD Heck-Watervliet Home
- Eddy Visiting Nurse and Rehab Association

3.6. SOURCE TYPES AND STACK PARAMETERS

The AERMOD dispersion model allows for emission units to be represented as point, area, or volume sources. In this modeling analysis, the new kilns and the new clinker coolers are represented as point sources. Truck unloading (ULF) is represented as a volume source. Only the kilns are included in the 1-hr NO_2 and 1-hr SO_2 modeling analysis per discussion with NYSDEC.

Table 3-2 presents the modeled source locations at Norlite. The coordinates are expressed in UTM NAD83, Zone 18 coordinates.

Table 3-2. Source Locations

Emission Source ID	Emission Source Description	Elevation (m)	UTM East (m)	UTM North (m)
NEW_SCB1	New Scrubber for Kiln #1	18.1	606017.7	4734280.2
NEW_SCB2	New Scrubber for Kiln #2	18.1	606021.0	4734291.3
CC1_NEW	Clinker Cooler #1	11.7	606119.5	4734258.3
CC2_NEW	Clinker Cooler #2	11.9	606120.9	4734275.2
FPC	Finishing Plant Crusher	10.8	606161.3	4734217.8
PSH_NEW	Shale Storage Silo (New Source)	17.9	606026.3	4734266.2
KFR_2	New Rim Seal and Loading Location Kiln 2	15.4	606048.3	4734280.7
KFR_1	New Rim Seal and Loading Location Kiln 1	15.1	606046.6	4734269.0
ULF	Alternate Fuel Unloading	18.5	606045.4	4734408.8

The source parameters for the point and volume emission sources are listed in Table 3-3 and Table 3-4 respectively. The site layout in Attachment A depicts the approximate location of all the sources on site, including the modeled volume and point sources to be used to model at Norlite.

Table 3-3. Point Source Parameters

Emission Source ID	Stack Height (m)	Exit Temperature (K)	Exit Velocity (m/s)	Exit Diameter (m)
NEW_SCB1	38.1	361.5	31.6	0.90
NEW_SCB2	38.1	361.5	31.6	0.90
CC1_NEW	26.5	462.6	13.8	1.14
CC2_NEW	26.5	462.6	13.8	1.14
FPC	15.4	294.3	0.001	1.1

Table 3-4. Volume Source Parameters

Emission Source ID	Release Height [a] (m)	Initial Lateral Dimension [b] (m)	Initial Vertical Dimension [c] (m)
PSH_NEW	30.5	1.43	14.2
KFR_2	1.5	0.37	0.7
KFR_1	1.5	0.37	0.7
ULF	2.9	5.58	2.7

[a] The release height is the height of the adjacent building.

[b] As per Table 3-2 in the AERMOD Userguide (August 2019), the initial lateral dimension of a volume source should be set equal to the volume source's width divided by 4.3.

[c] As per Table 3-2 in the AERMOD Userguide (August 2019), the initial vertical dimension of a volume source should be set equal to average source height divided by 2.15. This is appropriate for surface based sources or elevated sources on or adjacent to a building. As such, the average source height (release height) of the loading area is divided by 2.15 to get the initial vertical dimension.

3.7. GEP STACK HEIGHT ANALYSIS

U.S. EPA has promulgated stack height regulations that restrict the use of stack heights in excess of GEP in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. The minimum stack height not subject to the effects of downwash, called the GEP stack height, is defined by the following formula:

$H_{GEP} = H + 1.5L$, where:

H_{GEP} = minimum GEP stack height,
H = structure height, and
L = lesser dimension of the structure (height or projected width).

The wind direction-specific downwash dimensions and the dominant downwash structures used in this analysis are determined using BPIP PRIME. In general, the lowest GEP stack height for any source is 65 meters by default.[11] The actual stack height of the scrubbers and clinker coolers are less than the GEP height, therefore their actual height was modeled. GEP stack height does not apply to volume sources.

[11] 40 CFR §51.100(ii).

This section presents the results of the NAAQS, toxics, and unitized modeling analyses performed, following the procedures outlined in Sections 2 and 3. CD's for all AERMOD model runs are provided as Attachment C.

4.1. NAAQS ANALYSIS RESULTS

Emissions from the sources at Norlite were modeled and compared to the NAAQS. The results of the NAAQS analysis are presented in Tables 4-1 through 4-11.

Table 4-1. Modeling Results – PM_{10} 24-Hour

H6H Modeled Concentration (μg/m³)						Background (μg/m³)	Total Concentration (μg/m³)	NAAQS (μg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
10.87	9.20	9.53	9.57	8.97	10.87	35	45.87	150	Yes

Table 4-2. Modeling Results – $PM_{2.5}$ 24-Hour

5-year Average H8H Modeled Concentration (μg/m³)	Background (μg/m³)	Total Concentration (μg/m³)	NAAQS (μg/m³)	Below NAAQS?
6.13	15.9	22.03	35	Yes

Table 4-3. Modeling Results – $PM_{2.5}$ Annual

5-year Average Modeled Concentration (μg/m³)	Background (μg/m³)	Total Concentration (μg/m³)	NAAQS (μg/m³)	Below NAAQS?
1.10	6.1	7.2	12	Yes

Table 4-4. Modeling Results – NO_2 1-Hour

5-year Average H8H Modeled Concentration (μg/m³)	Background (μg/m³)	Total Concentration (μg/m³)	NAAQS (μg/m³)	Below NAAQS?
177.20	Included[12]	177.20	188	Yes

[12] A background concentration of 65.5 ug/m³ was included in the AERMOD file as an annual background concentration. Therefore, the presented H8H modeled concentration includes this background value in the result.

Table 4-5. Modeling Results – NO_2 Annual

1st High Modeled Concentration (µg/m³)						Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
3.21	3.00	3.02	3.30	2.93	3.30	14.14	17.44	100	Yes

Table 4-6. Modeling Results – SO_2 1-Hour

5-year Average H4H Modeled Concentration (µg/m³)	Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
173.81	13.02	186.83	196	Yes

Table 4-7. Modeling Results – SO_2 3-Hour

2nd High Modeled Concentration (µg/m³)						Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
97.04	81.35	100.49	86.55	94.66	100.49	13.02	113.51	1300	Yes

Table 4-8. Modeling Results – SO_2 24-Hour

2nd High Modeled Concentration (µg/m³)						Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
23.12	29.04	28.23	30.71	25.69	30.71	13.02	43.73	365	Yes

Table 4-9. Modeling Results – SO_2 Annual

1st High Modeled Concentration (µg/m³)						Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
4.46	4.16	4.20	4.58	4.07	4.58	3.40	7.98	80	Yes

Table 4-10. Modeling Results – CO 1-Hour

H2H Modeled Concentration (µg/m³)						Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
11.20	11.36	11.47	10.62	10.52	11.47	343.5	354.97	40,000	Yes

Table 4-11. Modeling Results –CO 8-Hour

H2H Modeled Concentration (µg/m³)						Background (µg/m³)	Total Concentration (µg/m³)	NAAQS (µg/m³)	Below NAAQS?
2013	2014	2015	2016	2017	Max.				
2.55	2.29	2.61	2.40	2.35	2.61	229.0	231.61	10,000	Yes

4.2. AIR TOXICS ANALYSIS RESULTS

Emissions from the sources at Norlite were modeled and compared to the AGC and SGC. The results of the air toxics analysis are presented in Tables 4-12 and 4-13.

Table 4-12: Short-term Toxics Results

Pollutant	CAS Number	SGC (µg/m³)	2013-2017 (µg/m³)	Below SGC?
Hydrogen Fluoride	07664-39-3	5.6	1.26	Yes
Mercury	07439-97-6	0.6	0.03	Yes
1,1,1-Trichloroethane	00071-55-6	9000	24.73	Yes
Benzene	00071-43-2	1300	18.17	Yes
Carbon tetrachloride	00056-23-5	1900	25.96	Yes
Vinyl chloride	00075-01-4	180000	1.13	Yes

Table 4-13: Long-term Toxics Results

Pollutant	CAS Number	AGC (µg/m³)	2013 (µg/m³)	2014 (µg/m³)	2015 (µg/m³)	2016 (µg/m³)	2017 (µg/m³)	MAX (µg/m³)	Below AGC?
Hydrogen Fluoride	07664-39-3	7.1E-02	0.02867	0.02677	0.02698	0.02946	0.02615	0.02946	Yes
Arsenic	07440-38-2	2.3E-04	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	Yes
Cadmium	07440-43-9	2.4E-04	0.00004	0.00004	0.00004	0.00005	0.00004	0.00005	Yes
Lead	07439-92-1	3.8E-02	0.00050	0.00047	0.00047	0.00051	0.00046	0.00051	Yes
Mercury	07439-97-6	3.0E-01	0.00074	0.00069	0.00070	0.00076	0.00068	0.00076	Yes
1,1,1-Trichloroethane	00071-55-6	5.0E+03	0.07315	0.06471	0.07032	0.06888	0.06645	0.07315	Yes
Benzene	00071-43-2	1.3E-01	0.05375	0.04760	0.05172	0.05061	0.04888	0.05375	Yes
Carbon tetrachloride	00056-23-5	1.7E-01	0.07684	0.06797	0.07386	0.07236	0.06980	0.07684	Yes
Dichlorodifluoromethane	00075-71-8	1.2E+04	0.02581	0.02410	0.02428	0.02652	0.02353	0.02652	Yes

Pollutant	CAS Number	AGC (µg/m³)	2013 (µg/m³)	2014 (µg/m³)	2015 (µg/m³)	2016 (µg/m³)	2017 (µg/m³)	MAX (µg/m³)	Below AGC?
Vinyl chloride	00075-01-4	1.1E-01	0.02565	0.02395	0.02413	0.02635	0.02339	0.02635	Yes
1,3-Butadiene	00106-99-0	3.3E-02	0.02549	0.02380	0.02398	0.02619	0.02324	0.02619	Yes
POM[b]		0.02	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	Yes

4.3. UNITIZED MODELING ANALYSIS

During the pre-modeling meeting on August 21, 2018, NYSDEC personnel requested that a comparison between the modeled offsite impact of the existing kilns and the Project Delta kilns be completed as part of this modeling effort. To streamline this approach and demonstrate the difference between the proposed new scrubbers and existing scrubbers, a unitized modeling analysis was performed.

This air dispersion modeling includes modeling an equal emission rate (i.e. one pound per hour) from each of the two existing stacks and two Project Delta stacks for 1-hour and annual averaging periods. This approach demonstrates that the ground level concentration impacts of the Project Delta scrubbers will be less than the existing scrubbers.

The new scrubbers have different dispersion characteristics and a different stack height which result in lower concentrations downwind. Therefore, from a dispersion perspective, the new scrubbers result in a lower offsite impact.

Figures 4-1 through 4-4 on the next two pages demonstrate the side-by-side impacts of the new proposed scrubber and the existing counterpart.

Figures 4-1 and 4-2 present scrubber 1 and scrubber 2, respectively, at the 1-hour averaging period. The teal color represents concentrations of 1 ug/m^3 and the dark blue color represents concentrations of 2 ug/m^3. Since these are unitized, the concentration values are used to demonstrate order of magnitude and do not have any implications with respect to the AGC or SCG of any particular compound. The figure on the left represents the Project Delta scrubbers and the figure on the right represents the existing scrubbers.

Figure 4-1. Scrubber 1: 1-hour Averaging Period

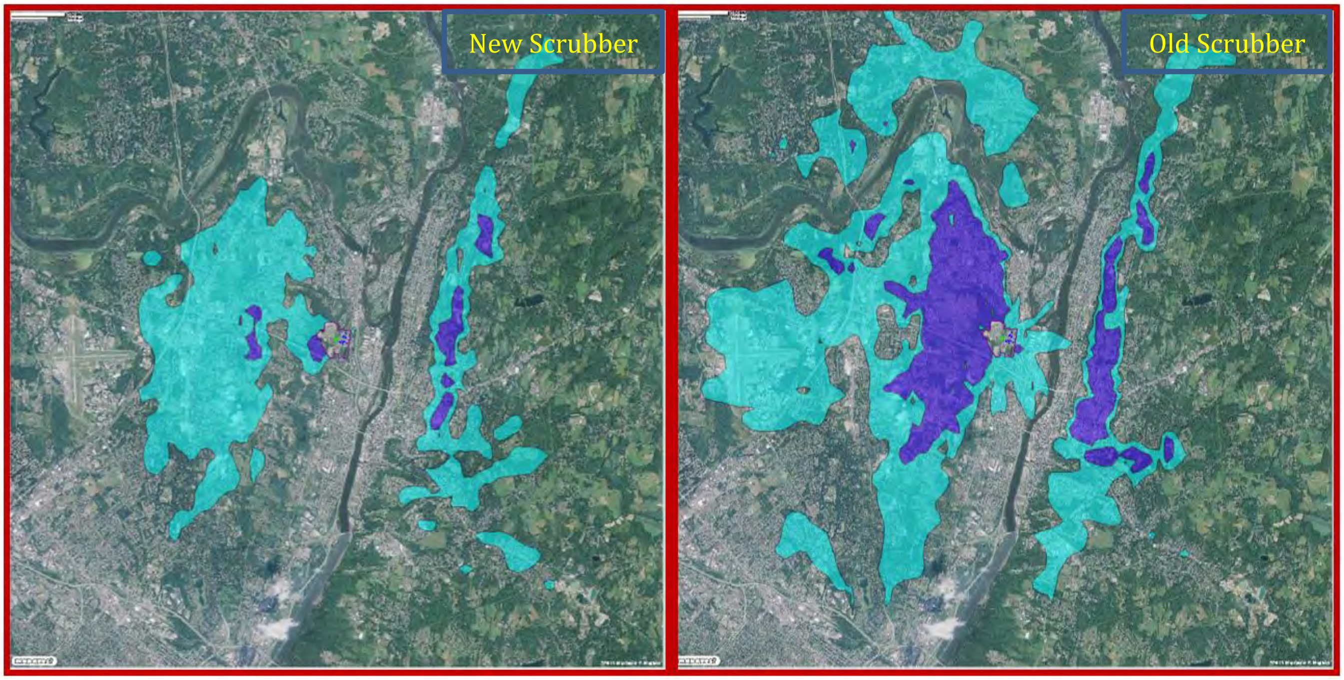
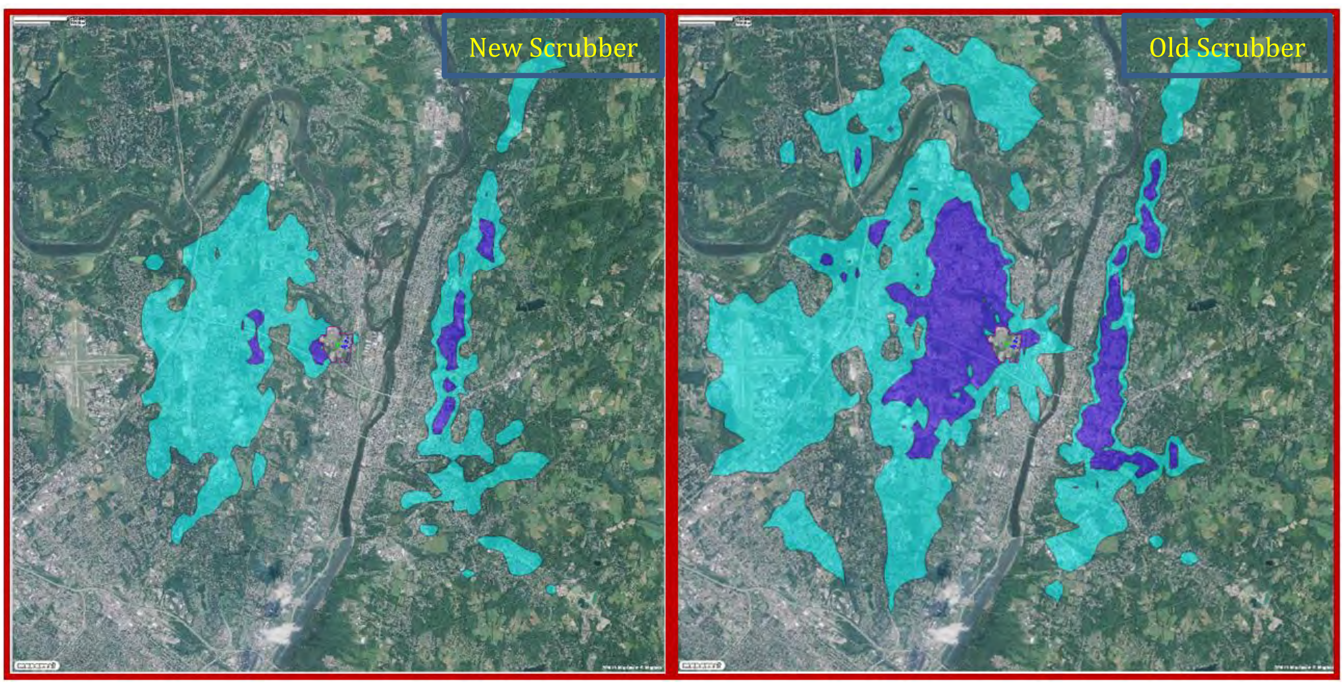


Figure 4-2. Scrubber 2: 1-hour Averaging Period



Figures 4-3 and 4-4 present scrubber 1 and scrubber 2, respectively, at the annual averaging period. The teal color represents concentrations of 0.05 ug/m^3 and the dark blue color represents concentrations of 0.10 ug/m^3. Since these are unitized, the concentration values are used to demonstrate order of magnitude and do not have any implications with respect to the AGC or SCG of any particular compound. The figure on the left represents the proposed new scrubber and the figure on the right represents the existing scrubber.

Figure 4-3. Scrubber 1: Annual Averaging Period

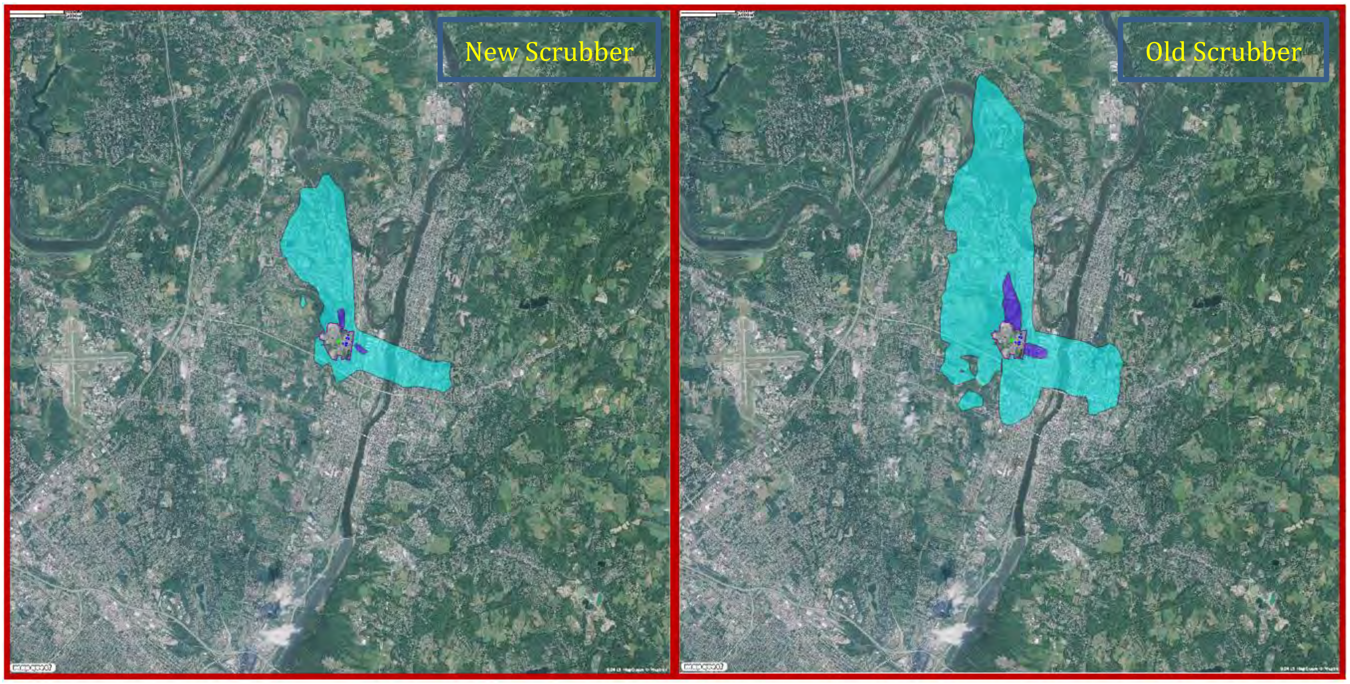
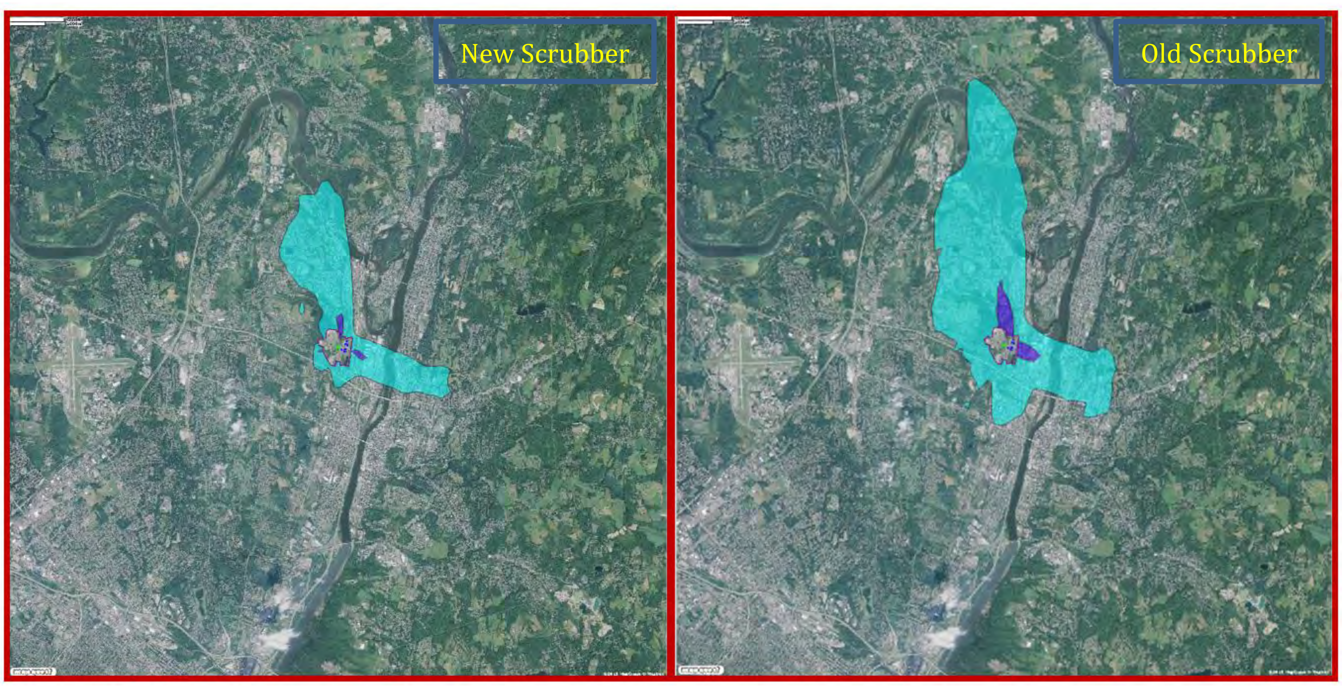


Figure 4-4. Scrubber 2: Annual Averaging Period



As illustrated in Figures 4-1 through 4-4, in all cases releases from the new Project Delta scrubbers result in a reduced impact area when compared to the existing scrubbers that have been in use at Norlite. Overall the net effect of Project Delta is beneficial with respect to off site impact.

4.4. SUMMARY OF RESULTS

Norlite is supplying this written air dispersion modeling report to provide the NYSDEC. Modeling files can be found on a CD as part of Attachment C. Norlite requests a written response to this report at NYSDEC's earliest convenience.

ATTACHMENT A: FACILITY SITE LAYOUT

ULF
NEW_SCB2
NEW_SCB1
KFR_2
PSH_NEW
KFR_1
CC2_NEW
CC1_NEW
PPC

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Site Wide Summary		Kiln 1 & 2 Emissions Summary (K-ILNSG) (Emission rates for 1 Kiln)			Kiln 1 Clinker Cooler (K-INLSG)			Kiln 2 Clinker Cooler (K-INLSG)		
Air Pollutant	CAS	HAP	ER	Emissions (lb/yr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [2,3,5] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)
Hydrogen Chloride	7647-01-0	Y	L	4.19E+04	2.09E+01	2.39E+00	1.04E+02	1.05E+01						
Hydrogen Fluoride	7664-39-3	Y	M	3.15E+03	1.58E+00	1.80E-01	7.83E+00	7.88E-01						
Dioxins & Furans (TEQ)	N/A	Y	HTAC, POM, PBT	6.57E-06	3.28E-09	3.75E-10	1.28E-08	1.64E-09						
Arsenic	7440-38-2	Y	HTAC	2.86E+00	1.43E-03	1.38E-04	2.46E-01	4.19E-04	6.79E-05	3.40E-03	2.98E-04	6.79E-05	3.40E-03	2.98E-04
Beryllium	7440-41-7	Y	HTAC	6.74E-01	3.37E-04	5.75E-05	1.03E-01	1.39E-04	6.79E-06	3.40E-04	2.98E-05	6.79E-06	3.40E-04	2.98E-05
Chromium	7440-47-3	Y	HTAC	2.95E+01	1.48E-02	2.21E-03	3.95E+00	7.02E-03	8.30E-05	4.15E-03	3.64E-04	8.30E-05	4.15E-03	3.64E-04
Cadmium	7440-43-9	Y	HTAC, PBT	2.73E+01	1.37E-02	2.73E-04	2.60E+01	6.82E-03	3.77E-06	1.88E-04	1.65E-05	3.77E-06	1.88E-04	1.65E-05
Lead	7439-92-1	Y	HTAC, PBT	1.89E+01	9.43E-03	3.06E-03	2.91E+02	4.42E-03	6.79E-05	3.40E-03	2.98E-04	6.79E-05	3.40E-03	2.98E-04
Mercury	7439-97-6	Y	HTAC, PBT	5.88E+01	2.94E-02	4.67E-03	1.02E-02	1.47E-02	2.31E-07	1.15E-05	1.01E-06	2.31E-07	1.15E-05	1.01E-06
Chlorine	7782-50-5		M	6.37E+02	3.18E-01	8.91E-02	8.91E-02	1.59E-01						
Antimony	7440-36-0	Y	M	1.96E+00	9.79E-04	4.38E-05	2.32E-01	1.92E-04	6.79E-05	3.40E-03	2.98E-04	6.79E-05	3.40E-03	2.98E-04
Barium	7440-39-3		M	5.20E+01	2.60E-02	2.35E-03	1.18E+01	1.03E-02	6.18E-04	3.09E-02	2.71E-03	6.18E-04	3.09E-02	2.71E-03
Copper	7440-50-8		M	5.41E+01	2.71E-02	2.45E-03	1.27E+01	1.07E-02	6.36E-04	3.18E-02	2.78E-03	6.36E-04	3.18E-02	2.78E-03
Nickel	7440-02-0	Y	HTAC	9.96E+00	4.98E-03	3.44E-04	1.75E+00	1.51E-03	2.24E-04	1.12E-02	9.82E-04	2.24E-04	1.12E-02	9.82E-04
Selenium	7782-49-2	Y	M	1.32E+00	6.62E-04	7.63E-06	4.56E-02	3.34E-05	6.79E-05	3.40E-03	2.98E-04	6.79E-05	3.40E-03	2.98E-04
Silver	7440-22-4		NL	2.67E-01	1.34E-04	8.45E-06	4.75E-02	3.70E-05	6.79E-06	3.40E-04	2.98E-05	6.79E-06	3.40E-04	2.98E-05
Thallium	7440-28-0		NL	1.48E+00	7.42E-04	1.68E-05	8.63E-02	7.36E-05	6.79E-05	3.40E-03	2.98E-04	6.79E-05	3.40E-03	2.98E-04
Zinc	7440-66-6		L	4.83E+01	2.41E-02	2.50E-03	1.28E+01	1.09E-02	2.58E-04	1.29E-02	1.13E-03	2.58E-04	1.29E-02	1.13E-03
1,1-Dichloroethene	75-35-4	Y	M	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
Methylene Chloride	75-09-2	Y	M	9.59E+01	4.80E-02	7.78E-04	7.78E-04	3.41E-03						
1,1-Dichloroethane	75-34-3	Y	L	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
(trans)1,2-Dichloroethane	107-06-2	Y	HTAC	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
2-butanone	78-93-3		M	7.02E+00	3.51E-03	4.01E-04	4.01E-04	1.76E-03						
Chloroform	67-66-3	Y	HTAC	1.11E+01	5.56E-03	6.35E-04	6.35E-04	2.78E-03						
1,2-Dichloroethane	107-06-2	Y	HTAC	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
Trichloroethene	79-01-6	Y	HTAC	8.25E+01	4.12E-02	1.90E-04	1.90E-04	8.34E-04						
1,1,1-Trichloroethane	71-55-6	Y	L	1.44E+02	7.21E-02	3.31E-04	3.31E-04	1.45E-03						
Benzene	71-43-2	Y	HTAC	1.19E+02	5.97E-02	1.03E-03	1.03E-03	4.50E-03						
Carbon tetrachloride	56-23-5	Y	HTAC	1.49E+02	7.43E-02	1.92E-04	1.92E-04	8.41E-04						
Methylene bromide	74-83-9		M	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
1,2-Dichloropropane	78-87-5	Y	M	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
4-methyl 2-pentanone	108-10-1	Y	M	7.44E+00	3.72E-03	4.25E-04	4.25E-04	1.86E-03						
cis-1,3-Dichloropropene	542-75-6 [15]		HTAC	3.65E+00	1.82E-03	2.08E-04	2.08E-04	9.12E-04						
(trans)1,3-Dichloropropene	542-75-6 [15]		HTAC	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Site Wide Summary		Kiln 1 & 2 Emissions Summary (K-ILNSG) (Emission rates for 1 Kiln)			Kiln 1 Clinker Cooler (K-INLSG)			Kiln 2 Clinker Cooler (K-INLSG)		
Air Pollutant	CAS	HAP	ER	Emissions (lb/yr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [2,3,5] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)
Bromodichloromethane	75-27-4		M	4.18E+00	2.09E-03	2.38E-04	2.38E-04	1.04E-03						
1,1,2-Trichloroethane	79-00-5	Y	HTAC	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
Toluene	108-88-3	Y	L	8.78E+01	4.39E-02	3.10E-03	3.10E-03	1.36E-02						
Tetrachloroethene	127-18-4	Y	HTAC	4.26E+00	2.13E-03	2.43E-04	2.43E-04	1.07E-03						
1,1,1,2-Tetrachloroethane	630-20-6		NL	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
Chlorobenzene	108-90-7	Y	M	1.77E+01	8.84E-03	1.10E+00	1.10E+00	4.42E-03						
Ethylbenzene	100-41-4	Y	M	4.28E+00	2.14E-03	2.44E-04	2.44E-04	1.07E-03						
m & p-xylenes	1330-20-7 [15]	Y	M	3.62E+00	1.81E-03	2.07E-04	2.07E-04	9.05E-04						
Styrene	100-42-5	Y	M	2.96E+00	1.48E-03	1.69E-04	1.69E-04	7.40E-04						
1,1,2,2-Tetrachloroethane	79-34-5	Y	HTAC	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
o-xylene	95-47-6 [15]	Y	M	3.73E+00	1.86E-03	2.13E-04	2.13E-04	9.32E-04						
Bromoform	75-25-2	Y	M	4.18E+00	2.09E-03	2.38E-04	2.38E-04	1.04E-03						
Dichlorodifluoromethane	75-71-8		NL	2.84E+03	1.42E+00	1.62E-01	1.62E-01	7.11E-01						
Chloromethane	74-87-3	Y	M	2.79E+03	1.39E+00	1.59E-01	1.59E-01	6.97E-01						
Vinyl chloride	75-01-4	Y	HTAC	2.82E+03	1.41E+00	1.61E-01	1.61E-01	7.06E-01						
1,3-Butadiene	106-99-0	Y	HTAC	2.79E+03	1.40E+00	1.60E-01	1.60E-01	6.99E-01						
Bromomethane	74-83-9	Y	M	2.81E+03	1.40E+00	1.60E-01	1.60E-01	7.02E-01						
Phenol	108-95-2	Y	M	3.65E+00	1.82E-03	2.08E-04	2.08E-04	9.12E-04						
2-Chlorophenol	95-57-8		NL	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
1,3-Dichlorobenzene	541-73-1		M	3.25E+00	1.62E-03	1.85E-04	1.85E-04	8.12E-04						
1,4-Dichlorobenzene	106-46-7	Y	M	2.00E+00	9.98E-04	1.14E-04	1.14E-04	4.99E-04						
1,2-Dichlorobenzene	95-50-1		M	3.57E+00	1.79E-03	2.04E-04	2.04E-04	8.93E-04						
2-Methylphenol	95-48-7	Y	NL	2.76E+00	1.38E-03	1.58E-04	1.58E-04	6.90E-04						
4-Methylphenol	106-44-5	Y	NL	3.33E+00	1.66E-03	1.90E-04	1.90E-04	8.32E-04						
Hexachloroethane	67-72-1	Y	H	4.89E-01	2.45E-04	2.79E-05	2.79E-05	1.22E-04						
Nitrobenzene	98-95-3	Y	M	4.89E-01	2.45E-04	2.79E-05	2.79E-05	1.22E-04						
2,4-Dimethylphenol	105-67-9		NL	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
2,4-Dichlorolphenol	120-83-2		NL	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
1,2,4-Trichlorobenzene	120-82-1	Y	NL	5.92E+00	2.96E-03	3.38E-04	3.38E-04	1.48E-03						
Hexachlorobutadiene	87-68-3	Y	M	4.89E-01	2.45E-04	2.79E-05	2.79E-05	1.22E-04						
Hexachlorocyclopentadiene	77-47-4	Y	M	9.80E+00	4.90E-03	5.59E-04	5.59E-04	2.45E-03						
2,4,6-Trichlorophenol	88-06-2	Y	NL	7.09E+00	3.55E-03	4.05E-04	4.05E-04	1.77E-03						
2,4,5-Trichlorophenol	95-95-4	Y	NL	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
2-Chloronaphthalene	91-58-7		HTAC, POM, PBT	4.89E-01	2.45E-04	2.79E-05	2.79E-05	1.22E-04						

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Site Wide Summary		Kiln 1 & 2 Emissions Summary (K-ILNSG) (Emission rates for 1 Kiln)			Kiln 1 Clinker Cooler (K-INLSG)			Kiln 2 Clinker Cooler (K-INLSG)		
Air Pollutant	CAS	HAP	ER	Emissions (lb/yr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [2,3,5] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)
2-Nitroaniline	88-74-4		NL	4.89E+00	2.45E-03	2.79E-04	2.79E-04	1.22E-03						
Dimethyl Phthalate	131-11-3	Y	NL	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
2,6-Dinitrotoluene	25321-14-6		H	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
4-Nitrophenol	100-02-7	Y	NL	9.80E+00	4.90E-03	5.59E-04	5.59E-04	2.45E-03						
2,4-Dinitrotoluene	121-14-2	Y	H	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
Diethyl Phthalate	84-66-2		M	1.92E+00	9.59E-04	1.10E-04	1.10E-04	4.80E-04						
Hexachlorobenzene	118-74-1	Y	HTAC, PBT	3.09E+00	1.54E-03	0.000176179	1.76E-04	7.72E-04						
Pentachlorophenol	87-86-5	Y	M	9.80E+00	4.90E-03	5.59E-04	5.59E-04	2.45E-03						
Di-n-butyl phthalate	84-74-2	Y	NL	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
Butylbenzylphthalate	85-68-7		M	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
Bis(2-ethylhexyl)phthalate	117-81-7	Y	NL	6.53E+00	3.26E-03	3.73E-04	3.73E-04	1.63E-03						
Di-n-octyl phthalate	117-81-7		M	2.45E+00	1.22E-03	1.40E-04	1.40E-04	6.12E-04						
Naphthalene	91-20-3	Y	M	1.14E+01	5.69E-03	6.49E-04	6.49E-04	2.84E-03						
2-Methylnaphthalane	91-57-6		NL	7.16E-02	3.58E-05	4.09E-06	4.09E-06	1.79E-05						
Acenaphthylene	208-96-8	Y	HTAC, POM, PBT	6.39E-02	3.19E-05	3.65E-06	3.65E-06	1.60E-05						
Acenaphthene	83-32-9	Y	HTAC, POM, PBT	1.91E-01	9.56E-05	1.09E-05	1.09E-05	4.78E-05						
Fluorene	86-73-7	Y	HTAC, POM, PBT	8.32E-02	4.16E-05	4.75E-06	4.75E-06	2.08E-05						
Phenanthrene	85-01-8	Y	HTAC, POM, PBT	1.77E-01	8.87E-05	1.01E-05	1.01E-05	4.44E-05						
Anthracene	120-12-7	Y	HTAC, POM, PBT	2.54E-02	1.27E-05	1.45E-06	1.45E-06	6.34E-06						
Fluoranthene	206-44-0	Y	HTAC, POM, PBT	7.18E-02	3.59E-05	4.10E-06	4.10E-06	1.80E-05						
Pyrene	129-00-0	Y	HTAC, POM, PBT	5.78E-02	2.89E-05	3.30E-06	3.30E-06	1.45E-05						
Benzo(e)pyrene	192-97-2	Y	HTAC, POM, PBT	6.12E-03	3.06E-06	3.50E-07	3.50E-07	1.53E-06						
Perylene	198-55-0	Y	HTAC, POM, PBT	1.53E-03	7.65E-07	8.73E-08	8.73E-08	3.82E-07						
Benzo(g,h,i)perylene	191-24-2	Y	HTAC, POM, PBT	2.42E-02	1.21E-05	1.38E-06	1.38E-06	6.05E-06						

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Site Wide Summary		Kiln 1 & 2 Emissions Summary (K-ILNSG) (Emission rates for 1 Kiln)			Kiln 1 Clinker Cooler (K-INLSG)			Kiln 2 Clinker Cooler (K-INLSG)		
Air Pollutant	CAS	HAP	ER	Emissions (lb/yr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [2,3,5] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)	Emissions (lb/hr)	ERP [4] (lb/hr)	Emissions (tons per yr)
Benzo(a)anthracene	56-55-3	Y	HTAC, POM, PBT	1.49E-04	7.44E-08	8.49E-09	8.49E-09	3.72E-08						
Chrysene	218-01-9	Y	HTAC, POM, PBT	2.09E-02	1.04E-05	1.19E-06	1.19E-06	5.21E-06						
Benzo(a)fluoranthene	203-33-8	Y	HTAC, POM, PBT	1.20E-03	6.01E-07	6.86E-08	6.86E-08	3.01E-07						
Benzo(k)fluoranthene	207-08-9	Y	HTAC, POM, PBT	1.61E-05	8.06E-09	9.21E-10	9.21E-10	4.03E-09						
Benzo(a)pyrene	50-32-8	Y	HTAC, POM, PBT	1.79E-03	8.97E-07	1.02E-07	1.02E-07	4.48E-07						
Indeno(1,2,3-c,d)pyrene	193-39-5	Y	HTAC, POM, PBT	1.71E-04	8.55E-08	9.76E-09	9.76E-09	4.28E-08						
Dibenz(a,h)anthracene	53-70-3	Y	HTAC, POM, PBT	1.22E-03	6.12E-07	6.98E-08	6.98E-08	3.06E-07						
Xylenes	108-38-3 [15]	Y	M	1.25E+01	6.25E-03									
Total POM	N/A	Y	HTAC, POM, PBT	1.22E+00		6.95E-05								

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Truck Unloading (ULF)				Part 212 Analysis (Control and / or Modeling Required)						Percent Control from APCD [8]			
Air Pollutant	CAS	HAP	ER	Emissions (lb/hr)	ERP (lb/hr)	Annual Emissions on Hourly Basis (lb/hr)	Emissions (tons per yr)	Model per 212? [9, 10]	Less than MEL ?	Less than PBT?	Control Required per Table 4 [11]	Emitted only from Kilns?	Part 63, Subpart EEE Applicable Citation	Kilns	Kiln 1 Cooler	Kiln 2 Cooler	Truck Unload-ing
Hydrogen Chloride	7647-01-0	Y	L					N	--	--	Kilns, 75%	Yes	Y, 63.1221(a)(6)	97.70%			
Hydrogen Fluoride	7664-39-3	Y	M					Y	--	--		Yes		97.70%			
Dioxins & Furans (TEQ)	N/A	Y	HTAC, POM, PBT					TIA (POM)	POM: N D/F: Y	POM: Y D/F: Y	Note 12	Yes	Y, 63.1221(a)(1)				
Arsenic	7440-38-2	Y	HTAC					TIA	N	--	Kilns 90%		Y, 63.1221(a)(4)	99.94%	98%	98%	
Beryllium	7440-41-7	Y	HTAC					N [13]	Y	--			Y, 63.1221(a)(4)	99.94%	98%	98%	
Chromium	7440-47-3	Y	HTAC					N [13]	Y	--			Y, 63.1221(a)(4)	99.94%	98%	98%	
Cadmium	7440-43-9	Y	HTAC, PBT					TIA	N	Y	Kilns < PBT. Model only.		Y, 63.1221(a)(3)	99.999%	98%	98%	
Lead	7439-92-1	Y	HTAC, PBT					TIA	N	Y	Kilns 99.5%		Y, 63.1221(a)(3)	99.999%	98%	98%	
Mercury	7439-97-6	Y	HTAC, PBT					TIA	N	Y	Kilns < PBT. Model only.		Y, 63.1221(a)(2)	54.36%	98%	98%	
Chlorine	7782-50-5		M					N	--	--	Note 12	Yes	Y, 63.1221(a)(6)				
Antimony	7440-36-0	Y	M					N [14]	--	--	Kilns: Note 12		Y, 63.1221(a)(7)	99.98%	98%	98%	
Barium	7440-39-3		M					N [14]	--	--	Kilns, 90%			99.98%	98%	98%	
Copper	7440-50-8		M					N [14]	--	--	Kilns, 90%			99.98%	98%	98%	
Nickel	7440-02-0	Y	HTAC					N [13]	Y	--	Kilns: Note 12		Y, 63.1221(a)(7)	99.98%	98%	98%	
Selenium	7782-49-2	Y	M					N [14]	--	--			Y, 63.1221(a)(7)	99.98%	98%	98%	
Silver	7440-22-4		NL					N [14]	--	--				99.98%	98%	98%	
Thallium	7440-28-0		NL					N [14]	--	--				99.98%	98%	98%	
Zinc	7440-66-6		L					N [14]	--	--	Kilns, 75%			99.98%	98%	98%	
1,1-Dichloroethene	75-35-4	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Methylene Chloride	75-09-2	Y	M	1.08E-01	1.08E-01	9.39E-03	4.11E-02	N [14]	--	--			Y, 63.1221(a)(5)				>95.0%
1,1-Dichloroethane	75-34-3	Y	L					N	--	--		Yes	Y, 63.1221(a)(5)				
(trans)1,2-Dichloroethane	107-06-2	Y	HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
2-butanone	78-93-3		M					N [14]	--	--		Yes					
Chloroform	67-66-3	Y	HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
1,2-Dichloroethane	107-06-2	Y	HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
Trichloroethene	79-01-6	Y	HTAC	1.04E-01	0.10	9.03E-03	3.96E-02	N [13]	Y	--		Yes	Y, 63.1221(a)(5)				>95.0%
1,1,1-Trichloroethane	71-55-6	Y	L	1.81E-01	0.18	1.58E-02	6.92E-02	Y	--	--			Y, 63.1221(a)(5)				>95.0%
Benzene	71-43-2	Y	HTAC	1.33E-01	0.13	1.16E-02	5.07E-02	TIA	N	--	ULF, 90%		Y, 63.1221(a)(5)				>95.0%
Carbon tetrachloride	56-23-5	Y	HTAC	1.90E-01	0.19	1.66E-02	7.27E-02	TIA	N	--	ULF, 90%		Y, 63.1221(a)(5)				>95.0%
Methylene bromide	74-83-9		M					N [14]	--	--		Yes					
1,2-Dichloropropane	78-87-5	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
4-methyl 2-pentanone	108-10-1	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
cis-1,3-Dichloropropene	542-75-6 [15]		HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
(trans)1,3-Dichloropropene	542-75-6 [15]		HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Truck Unloading (ULF)				Part 212 Analysis (Control and / or Modeling Required)						Percent Control from APCD [8]			
Air Pollutant	CAS	HAP	ER	Emissions (lb/hr)	ERP (lb/hr)	Annual Emissions on Hourly Basis (lb/hr)	Emissions (tons per yr)	Model per 212? [9, 10]	Less than MEL ?	Less than PBT?	Control Required per Table 4 [11]	Emitted only from Kilns?	Part 63, Subpart EEE Applicable Citation	Kilns	Kiln 1 Cooler	Kiln 2 Cooler	Truck Unload-ing
Bromodichloromethane	75-27-4		M					N [14]	--	--		Yes					
1,1,2-Trichloroethane	79-00-5	Y	HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
Toluene	108-88-3	Y	L	4.38E-02	4.38E-02		1.67E-02	N	--	--		Yes	Y, 63.1221(a)(5)				
Tetrachloroethene	127-18-4	Y	HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
1,1,1,2-Tetrachloroethane	630-20-6		NL					N [14]	--	--		Yes					
Chlorobenzene	108-90-7	Y	M					N	--	--		Yes	Y, 63.1221(a)(5), & 63.1221(c)(1)				
Ethylbenzene	100-41-4	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
m & p-xylenes	1330-20-7 [15]	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Styrene	100-42-5	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
1,1,2,2-Tetrachloroethane	79-34-5	Y	HTAC					N [13]	Y	--		Yes	Y, 63.1221(a)(5)				
o-xylene	95-47-6 [15]	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Bromoform	75-25-2	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Dichlorodifluoromethane	75-71-8		NL					Y	--	--		Yes					
Chloromethane	74-87-3	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Vinyl chloride	75-01-4	Y	HTAC					TIA	N	--		Yes	Y, 63.1221(a)(5)				
1,3-Butadiene	106-99-0	Y	HTAC					TIA	N	--		Yes	Y, 63.1221(a)(5)				
Bromomethane	74-83-9	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Phenol	108-95-2	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
2-Chlorophenol	95-57-8		NL					N [14]	--	--		Yes					
1,3-Dichlorobenzene	541-73-1		M					N [14]	--	--		Yes					
1,4-Dichlorobenzene	106-46-7	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
1,2-Dichlorobenzene	95-50-1		M					N [14]	--	--		Yes					
2-Methylphenol	95-48-7	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
4-Methylphenol	106-44-5	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
Hexachloroethane	67-72-1	Y	H					N	--	--		Yes	Y, 63.1221(a)(5)				
Nitrobenzene	98-95-3	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
2,4-Dimethylphenol	105-67-9		NL					N [14]	--	--		Yes					
2,4-Dichlorolphenol	120-83-2		NL					N [14]	--	--		Yes					
1,2,4-Trichlorobenzene	120-82-1	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
Hexachlorobutadiene	87-68-3	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Hexachlorocyclopentadiene	77-47-4	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
2,4,6-Trichlorophenol	88-06-2	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
2,4,5-Trichlorophenol	95-95-4	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
2-Chloronaphthalene	91-58-7		HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Truck Unloading (ULF)				Part 212 Analysis (Control and / or Modeling Required)						Percent Control from APCD [8]			
Air Pollutant	CAS	HAP	ER	Emissions (lb/hr)	ERP (lb/hr)	Annual Emissions on Hourly Basis (lb/hr)	Emissions (tons per yr)	Model per 212? [9, 10]	Less than MEL ?	Less than PBT?	Control Required per Table 4 [11]	Emitted only from Kilns?	Part 63, Subpart EEE Applicable Citation	Kilns	Kiln 1 Cooler	Kiln 2 Cooler	Truck Unload-ing
2-Nitroaniline	88-74-4		NL					N [14]	--	--		Yes					
Dimethyl Phthalate	131-11-3	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
2,6-Dinitrotoluene	25321-14-6		H					N [14]	--	--		Yes					
4-Nitrophenol	100-02-7	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
2,4-Dinitrotoluene	121-14-2	Y	H					N	--	--		Yes	Y, 63.1221(a)(5)				
Diethyl Phthalate	84-66-2		M					N [14]	--	--		Yes					
Hexachlorobenzene	118-74-1	Y	HTAC, PBT					N [13]	Y	Y		Yes	Y, 63.1221(a)(5)				
Pentachlorophenol	87-86-5	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
Di-n-butyl phthalate	84-74-2	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
Butylbenzylphthalate	85-68-7		M					N [14]	--	--		Yes					
Bis(2-ethylhexyl)phthalate	117-81-7	Y	NL					N	--	--		Yes	Y, 63.1221(a)(5)				
Di-n-octyl phthalate	117-81-7		M					N [14]	--	--		Yes					
Naphthalene	91-20-3	Y	M					N	--	--		Yes	Y, 63.1221(a)(5)				
2-Methylnaphthalane	91-57-6		NL					N [14]	--	--		Yes					
Acenaphthylene	208-96-8	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Acenaphthene	83-32-9	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Fluorene	86-73-7	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Phenanthrene	85-01-8	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Anthracene	120-12-7	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Fluoranthene	206-44-0	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Pyrene	129-00-0	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Benzo(e)pyrene	192-97-2	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Perylene	198-55-0	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Benzo(g,h,i)perylene	191-24-2	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				

Site Wide Speciated Toxics Emissions[1, 7]

December 2018 revisions only affect clinker cooler emissions of metals. See Section 3.2.2 in the Permit Narrative for additional details.

Compound				Truck Unloading (ULF)				Part 212 Analysis (Control and / or Modeling Required)						Percent Control from APCD [8]			
Air Pollutant	CAS	HAP	ER	Emissions (lb/hr)	ERP (lb/hr)	Annual Emissions on Hourly Basis (lb/hr)	Emissions (tons per yr)	Model per 212? [9, 10]	Less than MEL ?	Less than PBT?	Control Required per Table 4 [11]	Emitted only from Kilns?	Part 63, Subpart EEE Applicable Citation	Kilns	Kiln 1 Cooler	Kiln 2 Cooler	Truck Unload-ing
Benzo(a)anthracene	56-55-3	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Chrysene	218-01-9	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Benzo(a)fluoranthene	203-33-8	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Benzo(k)fluoranthene	207-08-9	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Benzo(a)pyrene	50-32-8	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Indeno(1,2,3-c,d)pyrene	193-39-5	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Dibenz(a,h)anthracene	53-70-3	Y	HTAC, POM, PBT					TIA (POM)	POM: N	POM: Y	Note 12	Yes	Y, 63.1221(a)(5)				
Xylenes	108-38-3 [15]	Y	M	1.64E-02	3.28E-01		6.25E-03	N [14]	--	--			Y, 63.1221(a)(5)				>95.0%
Total POM	N/A	Y	HTAC, POM, PBT					TIA	N	Y	Note 12		Y, 63.1221(a)(5)				

Notes:

[1] Storage tank emissions are not individually included in the speciated HAP emissions shown on this table because storage tanks emit to Kiln under normal operations.

[2] Kiln emission ERP for organics = PTE for organics.

[3] ERP for Kiln metals is calculated using uncontrolled emissions from "Inorganic HAP Emissions from Low Grade Fuel Combustion for Kilns - PTE" page and the products of combustion from the HAP from products of combustion of Used Oil.

[4] ERP for Kiln/Clinker Cooler is calculated by removing the control efficiency from the emissions on the "HAP Emissions from Kiln Cooler - PTE" sheet.

[5] Hydrogen chloride, hydrogen fluoride and doxin and furan data from FLS Pilot Study Test Report dated April 2018; ERP data from Table 1, Kiln Exit Section

[7] Speciated emissions from Drum Storage area is not included in this assessment as accurate speciation of this source is unreliable and overall VOC PTE is 0.35 tons per year.

[8] The semi-dry scrubber does not control organic species. Organic control efficiency represented for organic compounds is based on kiln DRE.

[9] Note that if one emission source requires modeling, Part 212 requires all sources at the facility under review that emit that pollutant to be included in that modeling analysis. Sources exempt from permitting in Part 201 are not subject to Part 212 and are excluded.

[10] For HTAC regulated by a NESHAP, 212-1.5(e)(2) requires that a Toxic Impact Assessment (TIA) be completed.

[11] If 'control' required by Table 4 of Part 212 is to meet Guideline Concentrations, that 'control' is not listed in this column, but is addressed in 'Model Per 212?' column.

[12] Specific control is not required for this compound because compound is regulated by EEE per 212-1.5(e)(2)

[13] Potential to emit HTAC on a site wide basis falls below MEL, therefore compliance with Part 212 is met per 212-2.1(a).

[14] Potential to emit non-HTAC on a site wide basis falls below 100 lb/yr, therefore DAR-1 implies no further action required.

[15] Sum of the emissions of this coumpound evaluated in Part 212 analysis with the compound's other isomer(s)