

**Additional Air Emission Estimates
White Pine Commerce Park
Final Generic Environmental Impact Statement**

The Onondaga County Industrial Development Agency (OCIDA) is proposing to develop a modern industrial park at its existing 339.26 acre White Pine Commerce Park property, located in the Town of Clay, New York. Pursuant to the NY State Environmental Quality Review Act (SEQRA), the OCIDA prepared a Generic Environmental Impact Statement (DGEIS) in 2012 for the proposed park, formerly referred to as the Clay Business Park.

The OCIDA has determined that additional air quality information may facilitate development decisions at the Park. The information below is provided in addition to information contained in the Draft GEIS issued in September 2012.

Several industry sectors have been identified as potential uses of the Park. The following list is not exhaustive and should not be interpreted as prohibiting any other potential uses or industries. This list is based on OCIDA knowledge of industry sectors showing interest in locating in the Upstate New York Region. These potential uses include:

- Manufacturing
 - Packaging
 - Solar
(Thermal/Photovoltaic)
 - Electronics
(Sensors and Controls)
 - Plastic and Metal
Components
 - Biofuels
- Office Services
- Data Management
 - Data Centers
- Food Processing
 - Fruits & Vegetables
 - Sauces
 - Fish & Meat
 - Dry Goods
 - Alcohol & Spirits
- Electricity Generation
(On-Site Use or Back-up)
 - Natural-gas fired turbines

Emission estimates are based on industry profiles prepared by the U.S Environmental Protection Agency (EPA), New York State Department of Environmental Conservation (NYSDEC) and other state environmental agencies and industry groups. Emissions are also based on actual industrial source information.

As discussed in the Draft GEIS (Chapter 1) up to 2.5 million square feet of development space may be constructed at the White Pine Commerce Park. The full build-out scenario that follows could reasonably be expected to occur given the existing physical conditions of the site. The scenario includes:

- A combined total of approximately 1.5 million square feet (SF) of manufacturing/assembly space

- Approximately 210,000 SF of laboratory, research and development (R&D) space
- Approximately 235,000 SF of logistics, warehousing, and/or shipping & receiving space
- Approximately 50,000 SF of office and administration space
- Approximately 175,000 SF of outdoor utility space, maintenance areas and service/storage yards
- Approximately 34,000 SF of on-site energy generation or electrical substation space
- Approximately 12,500 SF for wastewater treatment systems or pump stations

Significant sources of stationary air emissions are not expected from many of the possible uses at the Park. However, some manufacturing processes, R&D, and energy generation required for some operations could be sources of emissions. The estimated total emissions from potential industrial tenants at the proposed White Pine Commerce Park considered in the analysis are presented below and in the accompanying calculations.

Pollutant	Estimated Emissions (tons/year)	NYSDEC Major Source Threshold (tons/year)	US EPA “Presumed to Conform” Threshold (tons/year)
Nitrogen oxides (NO _x)	48.49	100	100
Carbon monoxide (CO)	46.17	100	100
Particulates (PM)	27.22	100	100
Volatile organic compounds (VOC)	48.88	50	50
Sulfur dioxide (SO ₂)	0.93	100	100

Pursuant to 40 CFR 93, Subpart B, a conformity determination is not required to be completed for the proposed Park based on current assumptions about future uses. The estimated emissions are “presumed to conform” with the State Implementation Plan (US EPA Thresholds) and are not anticipated to cause or contribute to any violation of air quality standards (as discussed in the DGEIS).

The estimated emissions from the possible mix of industries that may locate at the Park are also below the NYSDEC Major Source (Title V) permit thresholds. It is important to note that these limits would apply individually to each facility at the Park.

**Proposed White Pine Commerce Park
NYS Route 31, Town of Clay, NY
Final Generic Environmental Impact Statement
Air Emission Calculations**

The following calculations are based on actual emission estimates from several industrial sources and actual manufacturing facility emissions. Because there are no data regarding the specific products to be manufactured, industrial processes to be used, or potential throughputs at the White Pine Commerce Park, these calculations also used emission factors and guidance from US EPA's *AP-42, Compilation of Air Pollutant Emission Factors*.

Manufacturing Uses

Emission Estimates

Packaging

Packaging manufacturing is assumed to consist of bioplastic production. These processes are increasing in use and similar to conventional plastics manufacturing, but use feedstocks from renewable sources. VOC emissions result from the materials and processes used in plastics production. Particulate emissions may also be emitted, depending on the material produced.

AP-42, Section 6.6, contains emission factors for several types of plastics manufacturing. Based on these factors, emissions from packaging manufacturing are estimated at 3 tons per year of VOC and 5 tons per year of particulate emissions.

3 tpy VOC
5 tpy PM

Solar

Several different types of solar panels are currently being manufactured. For the purposes of this estimate, it is assumed that panels would be manufactured using the cadmium-telluride process.

10 tpy PM

Based on a review of existing facility permits, particulate emissions are estimated at 10 tons per year. VOC emissions are estimated at 2 tons per year.

2 tpy VOC

Electronics

For the purposes of this estimate, it is assumed that electronics manufacturing would consist largely of assembly processes using components manufactured elsewhere. As a result, emissions would be generated mainly from parts cleaning and similar processes. These processes typically use low evaporation solvents to reduce emissions. VOC emissions from electronics manufacturing are estimated at 5 tons per year.

5 tpy VOC

Plastic and Metal Components

For the purposes of this estimate, it is assumed that plastic components would be manufactured at the facility from raw materials. Metal components would be formed from intermediate products (e.g. bars, wires, conduits) and not forged at the facility. Processes such as brazing, welding, heat-treatment, and surface coating may be utilized.

5 tpy VOC

As discussed above, emissions from plastics manufacturing are estimated at 5 tons per year of VOC and 5 tons per year of particulate emissions. Emissions from metal component manufacturing are estimated to be similar. While VOC emissions would not result from forming and shaping of metal products, VOCs would be emitted from surface coating operations. Particulate emissions would result from welding, cutting, grinding, and similar operations.

5 tpy PM

For the purposes of this estimate it is assumed that process heating for plastic and metal component manufacturing would not be required.

Biofuels

Biofuel production is expected to be biodiesel or bioethanol.

For the purposes of this estimate, biodiesel production is assumed to use vegetable oils. These oils typically have high boiling point and low vapor pressures, and processing is typically performed at temperatures below 200 degF. As a result, only small amounts of VOC are released during processing. Reclamation of methanol used in the process may generate moderate amounts of VOC.

Emission factors for biodiesel production were not available. Based on consultant experience with chemical manufacturing operations, emissions from biodiesel production are estimated at 10 tons per year of VOC.

10 tpy VOC

Bioethanol is produced by fermentation of cellulose-containing plant material. Prior to fermentation, the material must be treated to release the cellulose for use in the fermentation process. It is assumed that a low temperature and low pressure process, such as concentrated acid hydrolysis, would be used for pretreatment. Emissions from bioethanol production are estimated at 10 tons per year of VOC.

It is likely that a biofuel production facility would require process heating. It is assumed that this heat would be generated via a 20 MMBTU/hr natural gas-fired boiler. Emissions from the use of this boiler on a continuous basis, based on AP-42 , Section 1.4, are as follows:

Estimated natural gas use: 172 MMSCF/yr

Pollutant	Emission Factor (lb/MMSCF)	Emissions (tons/yr)	
Nitrogen oxides (NOx)	100	8.59	171.7647 MMSCF
Carbon monoxide (CO)	84	7.21	
Particulates	7.6	0.65	
Volatile Organic Compounds (VOC)	5.5	0.47	
Sulfur dioxide (SO2)	0.6	0.05	

Food Production

Fruits/Vegetables/Sauces

VOC is released during the processing and canning of fruits, vegetables and sauces. Emission factors for food production were not available, but estimated from an existing food production facility in Montgomery County NY. Emissions are estimated at 10 tons per year of VOC.

10 tpy VOC

It is likely that a fruit/vegetable/sauce production facility would require process heating. It is assumed that this heat would be generated via a 20 MMBTU/hr natural gas-fired boiler. Emissions from the use of this boiler on a continuous basis, based on AP-42 , Section 1.4, are as follows:

Estimated natural gas use: 172 MMSCF/yr

Pollutant	Emission Factor (lb/MMSCF)	Emissions (tons/yr)	
Nitrogen oxides (NOx)	100	8.59	171.7647 MMSCF
Carbon monoxide (CO)	84	7.21	
Particulates	7.6	0.65	
Volatile Organic Compounds (VOC)	5.5	0.47	
Sulfur dioxide (SO2)	0.6	0.05	

Fish/Meat

It is assumed that fish/meat production would consist of processed foods. No significant emissions are expected from these processes. However it is likely that process heating would be required. It is assumed that it would be generated via a 5 MMBTU/hr natural gas-fired boiler. Emissions from the use of this boiler on a continuous basis, based on AP-42 , Section 1.4, are as follows:

Estimated natural gas use: 43 MMSCF/yr

Pollutant	Emission Factor (lb/MMSCF)	Emissions (tons/yr)	
Nitrogen oxides (NOx)	100	2.15	42.94118 MMSCF
Carbon monoxide (CO)	84	1.80	
Particulates	7.6	0.16	
Volatile Organic Compounds (VOC)	5.5	0.12	
Sulfur dioxide (SO2)	0.6	0.01	

Dry Goods

Particulate emissions are released during the processing of dried goods. Emission factors for dry good production were not available, but estimated from information on existing production facility emissions. Emissions are estimated at 2 tons per year of particulates.

2 tpy PM

Dry goods production is not expected to require significant amounts of process heating. If heating is required, it is assumed that it would be generated via a 5 MMBTU/hr natural gas-fired boiler. Emissions from the use of this boiler on a continuous basis, based on AP-42 , Section 1.4, are as follows:

Estimated natural gas use: 43 MMSCF/yr

Pollutant	Emission Factor (lb/MMSCF)	Emissions (tons/yr)	
Nitrogen oxides (NOx)	100	2.15	42.94118 MMSCF
Carbon monoxide (CO)	84	1.80	
Particulates	7.6	0.16	
Volatile Organic Compounds (VOC)	5.5	0.12	
Sulfur dioxide (SO2)	0.6	0.01	

Alcohol and Spirits

VOC emissions are released during fermentation and distillation steps of alcohol production. AP-42, Section 9.12.3, provides some limited emission factors for fermentation. Based on these factors, emissions from fermentation are estimated at 3 tons per year of VOC. Based on actual distillation operations, emissions are estimated at 2 tons per year of VOC. It is also expected that material handling operations would generate particulate emissions of 2 tons per year.

2 tpy PM
5 tpy VOC

It is likely that alcohol and spirits production would require process heating. It is assumed that it would be generated via a 5 MMBTU/hr natural gas-fired boiler. Emissions from the use of this boiler on a continuous basis, based on AP-42, Section 1.4, are as follows:

Estimated natural gas use: 43 MMSCF/yr

Pollutant	Emission Factor (lb/MMSCF)	Emissions (tons/yr)	
Nitrogen oxides (NOx)	100	2.15	42.94118 MMSCF
Carbon monoxide (CO)	84	1.80	
Particulates	7.6	0.16	
Volatile Organic Compounds (VOC)	5.5	0.12	
Sulfur dioxide (SO2)	0.6	0.01	

Data Centers

During normal operation, no emissions would be expected from a data center located at the Park. In order to maintain services during periods of electrical service interruption, any data center would include several emergency generators. These generators would meet the latest EPA standards for non-road engines. A total generator capacity of 25,000 kWe is estimated for data centers. Not all of this capacity would be used at one time, as several generators would serve as backups to other generators. As a result, the effective capacity of the generators would be approximately 17,500 kWe.

Generators are typically tested at low load levels (10%) on a weekly basis for one half-hour. Approximately 65 MW-hr per year would result from testing operations. For the purposes of this estimate, it is assumed that full backup power (80% load) would be required for 30 hours per year, or 420 MW-hr per year.

The estimated emissions are based on the EPA emission standards for large emergency generators and AP-42, Section 3.4.

Estimated annual use: 485 MW-hr

Pollutant	Emission Factor (lb/MW-hr)	Emissions (tons/yr)	
Nitrogen oxides (NOx)	14.11	3.42	485 MW-hr
Carbon monoxide (CO)	7.72	0.17	
Particulates	0.44	0.01	
Volatile Organic Compounds (VOC)	3.37	0.07	

Sulfur dioxide (SO ₂)	2.75	0.06
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On-Site Electricity Generation

The Park may utilize on-site electricity generation. It is assumed that electricity would be generated using natural gas-fired turbines. The estimated emissions below are based on a 3.5 megawatt turbine operating on a continuous basis. The estimates for NO_x, VOC and CO are based on manufacturer's specifications for a representative turbine. Estimates for other pollutants are based on AP-42, Section 3.1.

Estimated natural gas use: 428,977 MMBTU/yr

Pollutant	Emission Factor (lb/MMBTU)	Emissions (tons/yr)	
Nitrogen oxides (NO _x)	0.1	21.45	428977.2 MMBTU
Carbon monoxide (CO)	0.122	26.17	
Particulates	0.0066	1.42	
Volatile Organic Compounds (VOC)	0.035	7.51	
Sulfur dioxide (SO ₂)	0.0034	0.73	

Air Emission Totals

Pollutant	Emissions (tons/yr)
Nitrogen oxides (NO_x)	48.49
Carbon monoxide (CO)	46.17
Particulates	27.22
Volatile Organic Compounds (VOC)	48.88
Sulfur dioxide (SO₂)	0.93

Air Quality Assessment Information Sources:

<http://www.srsbiodiesel.com/Degumming.aspx>

http://www.jatrophaworld.org/makingbiodiesel_56.html

http://en.wikipedia.org/wiki/Biodiesel_production

<http://www.hort.purdue.edu/newcrop/ncnu02/v5-017.html>

BeechNut/Hero emission estimate (food)

St. Gobain emissions (plastics)

Avantor Distillation emissions (methanol recovery & alcohol distillation)

St. Joseph Hospital emissions (turbine)

plastics: AP-42 indicates relatively low emissions.. ~2.5 tons per 1 million pounds for polystyrene,
~2 tons for PETE

alcohol/spirits: used 1,000,000-2,000,000 gal/yr, 10% yield (grain to finished product)

http://www.ecy.wa.gov/programs/air/quincydatacenter/docs/A-Revised-Final-Tier2-Risk-Analysis_Vantage_11-28-2012.pdf

generator sizing & primary/backup ratio

http://wwwapp.epa.ohio.gov/dapc/permits_issued/524143.pdf

First solar permit from Ohio.

some info on generators req'd for data centers

<http://www.ecy.wa.gov/programs/air/quincydatacenter/index.html>