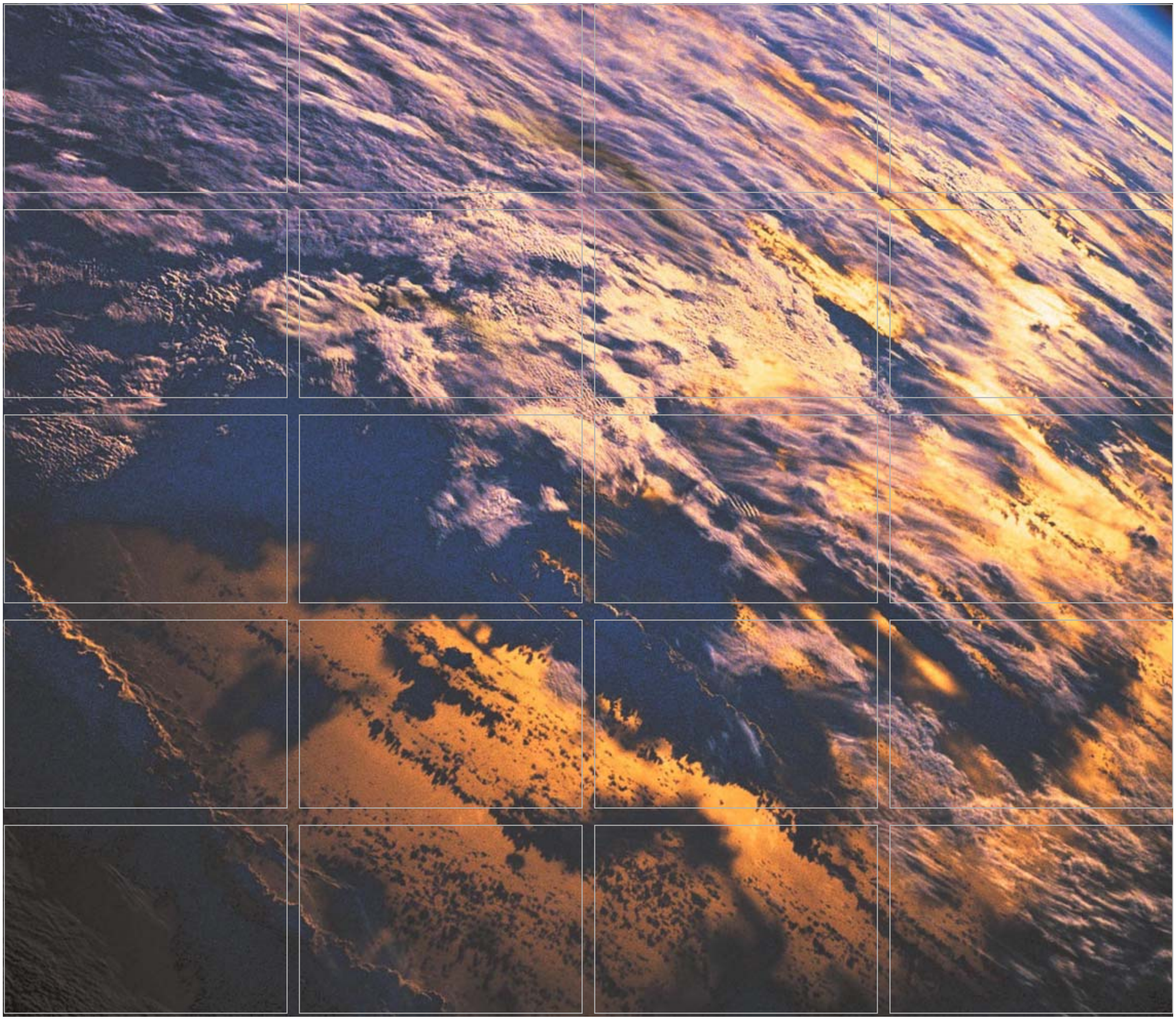
Appendix A
Permit Application Summary



Appalachian Shale Cracker Enterprise, LLC (ASCENT)

5100 Westheimer Road Suite 585
Houston, TX 71056

Permit Application Summary
Washington, West Virginia

May 2014

Prepared by:
Environmental Resources Management
204 Chase Drive
Hurricane, WV, 25526

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1.0 INTRODUCTION

1.1 PURPOSE

The Appalachian Shale Cracker Enterprise, LLC (ASCENT) Project (the "Project") proposes the construction of a new industrial facility in Washington, Wood County, West Virginia, approximately 10 kilometers southwest of Parkersburg, West Virginia.

Because the air quality in the area already attains all applicable national ambient air quality standards, the Project is subject to Prevention of Significant Deterioration (PSD) program. The potential air quality emissions from the proposed Project make the facility a major source for purposes of the PSD program in the State of West Virginia; therefore, all PSD permit application proceedings are required. This application includes all necessary information to support the PSD permit application in accordance with West Virginia Code of State Rules Title 45, Series 14 (45 CSR 14) including: a description of the proposed emission sources; the estimated air emissions for the project; an assessment of the control technologies implemented for the project; an assessment of the emissions to air quality per air dispersion modeling; and supporting documentation.

The completed PSD permit application forms required to be submitted to the West Virginia Department of Environmental Quality (WVDEP) are included as part of this application.

1.2 PROJECT OVERVIEW

The ASCENT Project proposes the construction of a new industrial facility on the east bank of the Ohio River at the site of an existing plastics facility in Washington, Wood County, West Virginia. The proposed site is approximately 376 acres of land. Braskem America (Braskem) closed on the final purchase of the southern portion of the property in January 2014. It later assigned the majority of the land to ASCENT and intends to assign the remainder shortly. Odebrecht is the ultimate parent company of ASCENT as well as of ASCENT's affiliate, Braskem, which plans to operate the facility upon completion of construction.

The Project includes the construction of one Ethane Cracker Plant to process and reform raw ethane into ethylene and propylene, three Polyethylene Plants to produce various types of polyethylene, and associated utility support. Site figures are located in Appendix B of the permit application including a Site Location Map (Figure B-1) and a Site Layout Map (Figure B-2). The proposed facility will manufacture inert polyethylene pellets, using ethane from Appalachian Shale as the raw material. The ethane is delivered to the plant via pipeline. The ethane will not be pure, but instead contains fractions of heavier hydrocarbons, which are cracked out and reformed. The ethane is thermally 'cracked' to produce ethylene and propylene that are, in turn, the feedstock to produce polyethylene. The polyethylene pellets are shipped from the site via rail or truck. Polyethylene is widely used in an array of plastic manufacturing industries, including everyday household and industrial items such as food containers, toys, shipping containers, piping, and adhesives.

1.3 PROJECT SCHEDULE

Construction of the Project is scheduled to commence the second quarter of calendar year 2015 based on a 12-month PSD permitting timeline from the time of this application. With an estimated 36 to 42 month construction schedule, commercial operation is expected to occur during the fourth quarter of 2018 or the first quarter of 2019.

1.4 APPLICATION ORGANIZATION

This application is organized into the following sections:

- Section 2.0 provides a description of the Project emissions sources;
- Section 3.0 discusses the potential emissions from the Project;
- Section 4.0 discusses the PSD applicability;
- Section 5.0 discusses the Non-Attainment New Source Review (NA-NSR) applicability;
- Section 6.0 provides a summary of applicable federal and State air quality regulations; and
- Section 7.0 provides a brief summary of the air quality assessment to support the air permit application.

2.0 PROJECT DESCRIPTION

The proposed ASCENT facility will be located at the previous SABIC plastic manufacturing site in Washington, Wood County West Virginia; adjacent to the Ohio River southeast of Parkersburg. The site is zoned for industrial use, and provides multiple strategic advantages for the processing of raw ethane captured from Appalachian Shale. The Project intends to construct and operate one Ethane Cracker Plant, three polyethylene plants, associated support utilities, process and storage tanks, and other miscellaneous sources. The design information discussed in this application is based on best available design information provided by vendors at the time of this application. The following section identifies the primary equipment and operations that will contribute to the facility-wide air emissions.

The Ethane Cracker Plant will consist of the following;

- Six (6) Pyrolysis Cracking Furnaces each with a rating of 396.8 million British Thermal Units per hour (MMBtu/hr) fired on a fuel mixture of recycled tail gas and natural gas;

- One (1) natural gas-fired thermal oxidizer with a maximum heat input of 130 MMBtu/hr, used to control various product, recycle, and waste streams generated by the Ethane Cracker Plant;

- One (1) emergency “main flare” equipped with duplicative natural gas piloted burners each rated at 0.41 MMBtu/hr (0.82 MMBtu/hr total). Note: The main flare also supports the three polyethylene plants; and

- Three (3) flares equipped with natural gas piloted burners with a combined rating of 1.0 MMBtu/hr.

The primary emission sources associated with the three polyethylene plants will consist of the following;

- One (1) natural gas-fired Regenerative Thermal Oxidizer (RTO) with a maximum heat input of 20 MMBtu/hr;

- One (1) low pressure flare equipped with duplicative natural gas piloted burners each rated at 0.2 MMBtu/hr (0.4 MMBtu/hr total); and

- One (1) natural gas-fired heater with a maximum heat input of 10 MMBtu/hr, associated with catalyst activation operations; and

- Material handling operations.

The emission sources associated with support utility operations will consist of the following;

- One (1) natural gas fired GE 7EA Combustion Turbine with a maximum heat input of 942.6 MMBtu/hr, equipped with a natural gas-fired duct burner with a maximum heat input rating of 346MMBtu/hr;

- Two (2) natural gas-fired auxiliary boilers each with a maximum heat input of 206 MMBtu/hr;

- Nine (9) Ultra Low Sulfur Diesel (ULSD) fired emergency generators with heat inputs ranging from 350 kilowatts (kW) to 2800 kW;

- Three (3) ULSD-fired fire water Pump engines each with a rating of 485 kW;

- One (1) cooling tower for non-contact cooling utilized in both the production of ethylene and polyethylene;

- One (1) Wastewater Treatment Plant (WWTP) comprised of a wastewater collection system, an effluent treatment system, and a waste reuse and final discharge system; and

- Storage tanks and loading racks.

Process flow diagrams for the emissions sources associated with the Project are included in Appendix C of the permit application.

2.1 ETHANE CRACKER PLANT

The ethane feedstock for the Ethane Cracker Plant will consist of Appalachian Shale ethane, supplied via pipeline, and recycled hydrocarbon feeds. The ethane feedstock coming from the pipeline is handled and condensed inside a storage unit. The ethane storage consists of three storage ‘bullet’ tanks to store the ethane feed for the Cracker Plant in case of unavailability of straight-run feedstock from the upstream gas pipeline. The 'cracking' process refers to the thermal breakdown of large complex organic molecules, such as ethane, into smaller organic constituents, such as ethylene and propylene. A process flow diagram for the Ethane Cracker Plant is presented in Figure 2-1, which outlines all major processes and equipment, including cracking furnaces, a quench tower, a compressor section, a caustic removal section, an ethylene recovery section, and the thermal oxidizer.

2.1.1 Pyrolysis Furnaces

The Project is for the construction of six pyrolysis (i.e., cracking) furnaces, each with a maximum heat input rating of 396.8 MMBtu/hr, in order to thermally 'crack' the ethane feedstock into ethylene and other products. In normal steady state operations, five cracking furnaces are fired to process the ethane feedstock (1,984 MMBtu/hr at 100% load) while one cracking furnace will be maintained on hot stand-by. All six furnaces will be identically designed to crack the mixture of ethane and recycled hydrocarbon streams.

Each furnace will consist of a single cell radiant section (i.e., firebox) with bottom and side fired burners, a convection section, and an induced draft fan. The fuel source used by the furnaces will consist of a blend of natural gas and recycled tail gas. The fuel blend will be a hydrogen rich gas mixture with an estimated heating value of 523 Btu per standard cubic foot (scf). The fuel combustion will take place in two firing zones for each furnace, one on either end of the firebox. An induced draft fan, located on top of the convection section, will be driven by a variable speed electric motor to produce draft in the furnace.

All bottom and side burners associated with the six furnaces will utilize Ultra-low NO_x Burners (ULNB) with vendor guaranteed control efficiencies on total NO_x emissions. Section 3.0 of this application provides a more detailed discussion on emissions and control equipment for each furnace. Each furnace will have its own exhaust stack and each stack is expected to be at least 65 meters above grade. The furnaces are designed with the intention to operate on a continual basis.

2.1.2 Coke Formation and Removal

The actual "cracking" of ethane and hydrocarbon feeds involves the dehydrogenation and condensation of ethane, such that only olefins are produced in the radiant coils. Because of this thermal reaction, the radiant tubes gradually become coated with an internal layer of coke, causing an increase in metal temperature and an increase in pressure drop through the radiant coils. This coke layer tends to retard the heat transfer from the tube walls of the radiant coil to the feed passing through it, which adversely affects the pyrolysis yield pattern.

The coke accumulation on the radiant coils necessitates periodic cleaning, referred to as "decoking", with one cleaning event typically occuring every 60 to 70 days per furnace, in order to prevent overheating and to restore the original yield pattern. The cleaning of the coke deposits is achieved by lowering the firing rate to thirty percent normal firing rate (approximately 119 MMBtu/hr) and injecting a steam/air mixture into the tubes to burn off the coke, a procedure known as decoking. During the decoking procedure, the furnace effluent from the radiant tubes is routed back to the firebox for additional pollutant destruction. To control the burning of the coke, a sample point for CO_2 analyses is installed on the decoking effluent to ensure full oxidation of the coke material occurs. Figure 2-2 depicts the decoking procedures used for each of the six pyrolysis furnaces.

Figure 2-1 Ethane Cracker Process Flow Diagram

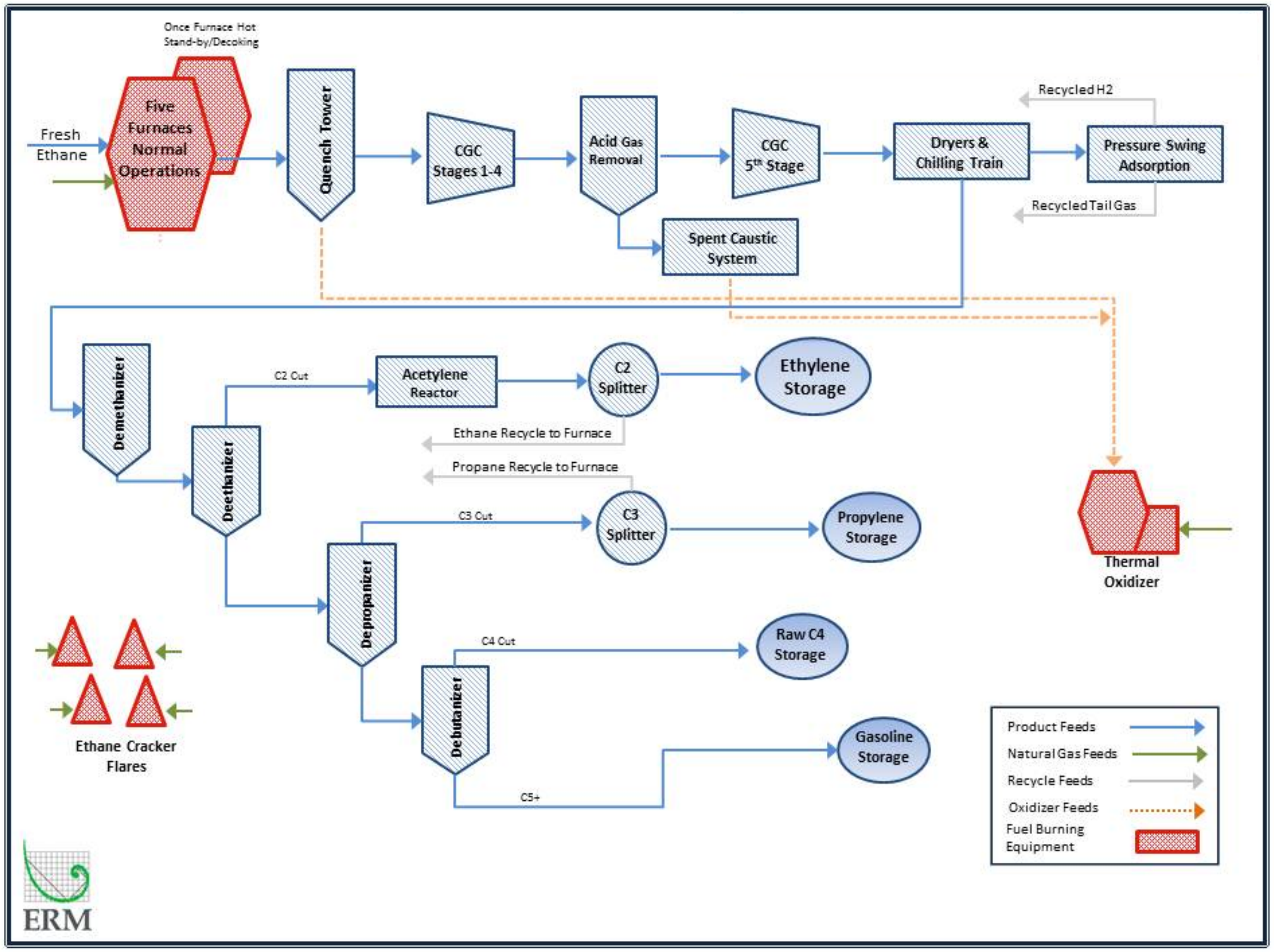
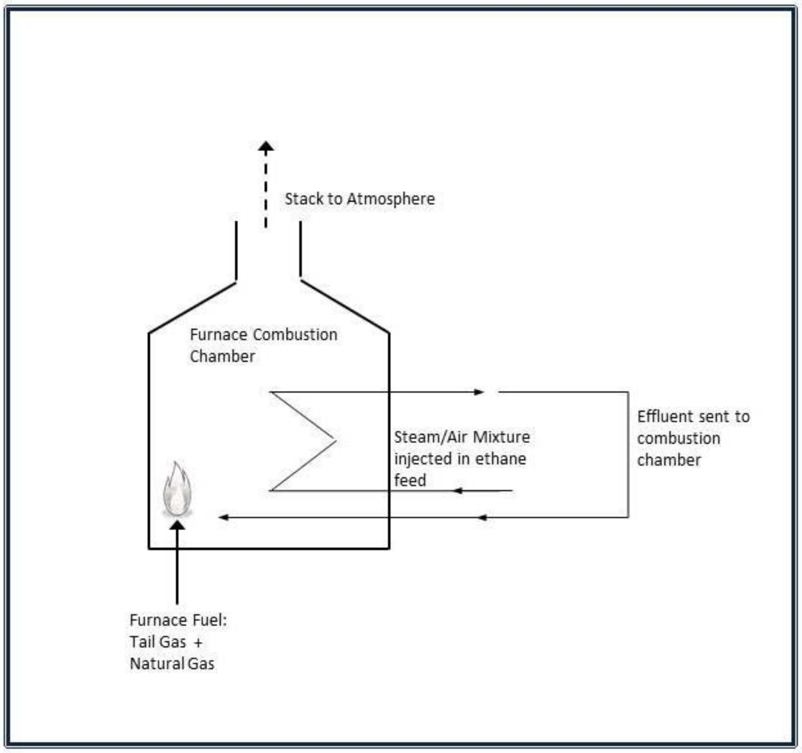


Figure 2-2 Pyrolysis Furnace Decoking Operations



2.1.3 *Quench Tower*

The cracked gases leaving the pyrolysis furnaces are cooled by direct contact with circulating quench water within the quench water tower. The purpose of the quench tower is to reduce the cracked gas temperature to an acceptable level for compression, to treat the process water, and to generate dilution steam. After the circulating quench water encounters the cracked gas streams, it is pumped into cyclones designed to remove tar and coke particles. In normal operation, two cyclones will be in service and a third one will be used as a backup.

2.1.4 *Cracked Gas Compressor (CGC)*

Cracked gases from the quench water tower are fed to the Cracked Gas Compressor (CGC). The CGC is a five-stage centrifugal machine arranged in three casings. It is driven by a steam turbine using high-pressure steam produced by the cracking furnaces. The gases pass through each CGC stage, successively being cooled to an appropriate pressure and temperature.

2.1.5 *Caustic Removal and Gas Drying*

Between the fourth and fifth stages of the CGC, the cracked gas product feed will be routed to an acid gas removal section (caustic soda scrubber) to eliminate excess carbon dioxide and hydrogen sulfide. All spent caustic solution will be withdrawn from the column and be sent to the spent caustic treatment, where it will undergo a partial degasification of the volatile hydrocarbons.

The chilled gas leaving the fifth stage of the CGC is routed to one of two cracked gas driers (one in operation and one in stand-by mode). The gas flows from the top to the bottom of the drier, while the water content of the gas is successively reduced to less than 1 ppm or less. The driers use regeneration gas, sent in a counter current direction (bottom to top), to release the adsorbed water from the cracked gas.

2.1.6 *Ethylene Recovery and Purification*

The final recovery of ethylene is achieved by condensation in a chilling section and a series of purification steps. Processed gases leave the driers and pass through a gas filter before entering the chilling section. Ethylene and heavier hydrocarbons are condensed progressively by chilling the gases in steps at below freezing temperatures. Condensation is achieved by the use of a mixed refrigerant through an open loop type refrigeration system. After being chilled, the cracked gases are then routed for separation and purification.

Ethylene is separated from recycled hydrocarbons in a series of distillation steps. First, the cracked gasses are routed to a demethanizer where light components such as methane, are extracted from the overhead product and routed back to the CGC for recycle. The bottom product is reheated and transferred to the deethanizer. The overhead product of the deethanizer (C2 stream) is sent to the acetylene reactor and the bottom product is sent to the depropanizer and the debutanizer. Ethylene is sent to a double-walled refrigerated storage tank. Propylene, raw mix C4s (mostly butadiene), and pyrolysis gasoline are final products sent to storage tanks from the process. Propylene, raw mix C4s, and pyrolysis gasoline are transferred as final product off site via loading racks. Ethylene is sent as the primary input to the polyethylene plants.

2.1.7 *Thermal Oxidizer*

One thermal oxidizer will be constructed and operated for the control of organic vapor and liquid streams generated by the Ethane Cracker Plant. The thermal oxidizer is equipped with a radiant section and a natural gas burner rated at 130 MMBtu/hr. ASCENT is coordinating with the design technology vendors to properly identify all streams to the thermal oxidizer. The potential streams sent to the oxidizer include slop oil, tar water, wet flare condensates and hydrocarbons. Liquid streams generated by the Ethane Cracker Plant not sent to the thermal oxidizer will be sent to the WWTP for treatment and final disposal, described in more detail below. All product and recycle feeds associated with the Ethane Cracker Plant will also be connected to the main flare inlet feeds in the event of any unplanned over pressuring event. The WWTP is discussed in Section 2.3.5. The flares are discussed in Section 2.1.8 below.

The thermal oxidizer is designed to achieve a Destruction and Removal Efficiency (DRE) of 99.9% for all VOC and organic HAP constituents.

2.1.8 *Ethane Cracker Flares*

Four flare stacks will be designed and constructed for the Ethane Cracker operations; the main flare, oxygen flare, ethylene storage flare and product storage flare. Each flare will be equipped with a primary natural gas pilot and an identical backup natural gas pilot. All four flares will have a 98 % DRE for all streams sent for combustion.

The main flare will be constructed and operated for any unplanned over pressuring emergency event. The main flare is also connected to the three polyethylene plants described in Section 2.2. The main flare pilots will have a combined heat input of 0.82 MMBtu/hr.

The oxygen flare will be constructed to control pressure relief from the thermal oxidizer. The oxygen flare pilots will have a combined heat input of 0.2 MMBtu/hr. The ethylene storage flare will be constructed to control any flammable gases generated from the ethylene storage silos. The product storage flare will be constructed to control any flammable gases generated from the propylene and gasoline storage tanks. These two flare stacks will each be identically designed with natural gas pilots, each having a total heat input of 0.4 MMBtu/hr. This heat input incorporates natural gas backup pilots.

2.2 *POLYETHYLENE (PE) PLANTS*

The final polyethylene pellets will be produced by three independent PE plants; Plant A, Plant B, and Plant C. Each plant will utilize a slightly altered manufacturing process to produce three types of polyethylene pellets. The three units will share a common ethylene feed but all other operations will be independent and separate. Each PE plant will be connected to main flare for any unplanned over pressuring event. One Regenerative Thermal Oxidizer (RTO) will be used to treat waste streams generated by Plant C and one low pressure flare will be used control any off-gases generated by Plant B. Figure 2-3A, Figure 2-3B, and Figure 2-3C depict process flow diagrams for each polyethylene plant.

Plant A will consist of four main sections associated with the following operations; purification, polymerization, purging and vent recovery, and extrusion and pelletizing. The purification section will include the use of one natural gas-fired heater, rated at 10 MMBtu/hr, in order to heat up the catalyst to an appropriate temperature. All pellets will be stored in storage silos before being transported offsite via rail or trucks.

Plant B will consist of four main sections associated with the following operations; purification, polymerization, purging and vent recovery, and extrusion and pelletizing. The polymerization section will be comprised of a series of compressors and pumps that will transfer raw ethylene and a comonomer catalyst to the polymerization reactor. After polymerization, the product streams will be sent to purging and vent recovery, to recover all excess hydrocarbon streams. All purged gasses will be sent to the recovery system, where it will be eventually recycled back into the polymerization. All pellets will be stored in storage silos before being transported offsite via rail or trucks.

Plant C will consist of the following operational sections; compression, polymerization, separation, extrusion and pelletizing, pellet handling, and degassing. Ethylene is combined with the catalyst in the compression section before being sent to reactors for polymerization. The product stream is then sent to the separation section to recover excess hydrocarbon streams for recycle. The product stream then undergoes extrusion, pelletizing, and pellet handling before a final degassing section. All pellets will be stored in storage silos before being transported offsite via rail or trucks.

2.2.4 *Regenerative Thermal Oxidizer (RTO)*

One Regenerative Thermal Oxidizer (RTO) will be constructed to treat gas streams generated by Plant C operations. The RTO will destruct excess hydrocarbon gas emissions. The gas streams sent to the RTO will originate from Plant C's waste oil storage and extrusion section. The RTO will treat the streams through high temperature oxidation. A natural gas burner, with a maximum rating of 20 MMBtu/hr will be designed to supply the start-up heat and the heat necessary to sustain high enough temperatures for the oxidation chamber. After passing through the oxidation chamber, the purified air will be emitted through a stack to the atmosphere.

The RTO will be equipped with a Low NOx Burner and at a minimum, will have a DRE of 99% for all VOC and organic HAP constituents.

2.2.5 *Polyethylene Plant Flares*

The three polyethylene plants will all be connected to the main flare for the entire facility in the event of any unplanned over pressuring event. A low pressure flare will be constructed to control any flammable gases generated from the Plant B storage silos. The low pressure flare will be designed with a natural gas pilot and a backup pilot, with a total heat input of 0.4 MMBtu/hr. The flare will have a 98% DRE for all gas streams sent to the flare for combustion.

2.2.6 *Material Handling Operations*

Particulate emissions can occur from material handling operations at any of the three polyethylene plants including, but not limited to, the following operations: extrusion, silo storage, additive feed, additive tanks, blending, and loading. Control of these emissions will be obtained through the use cyclones, baghouses, fabric filters or equivalent controls with an expected DRE greater than 99.9 percent or have an exhaust particulate concentration of less than 0.01 grain/scf. Best management practices for controlling particulate matter will be implemented.

Figure 2-3A   PE Plant A Process Flow Diagram

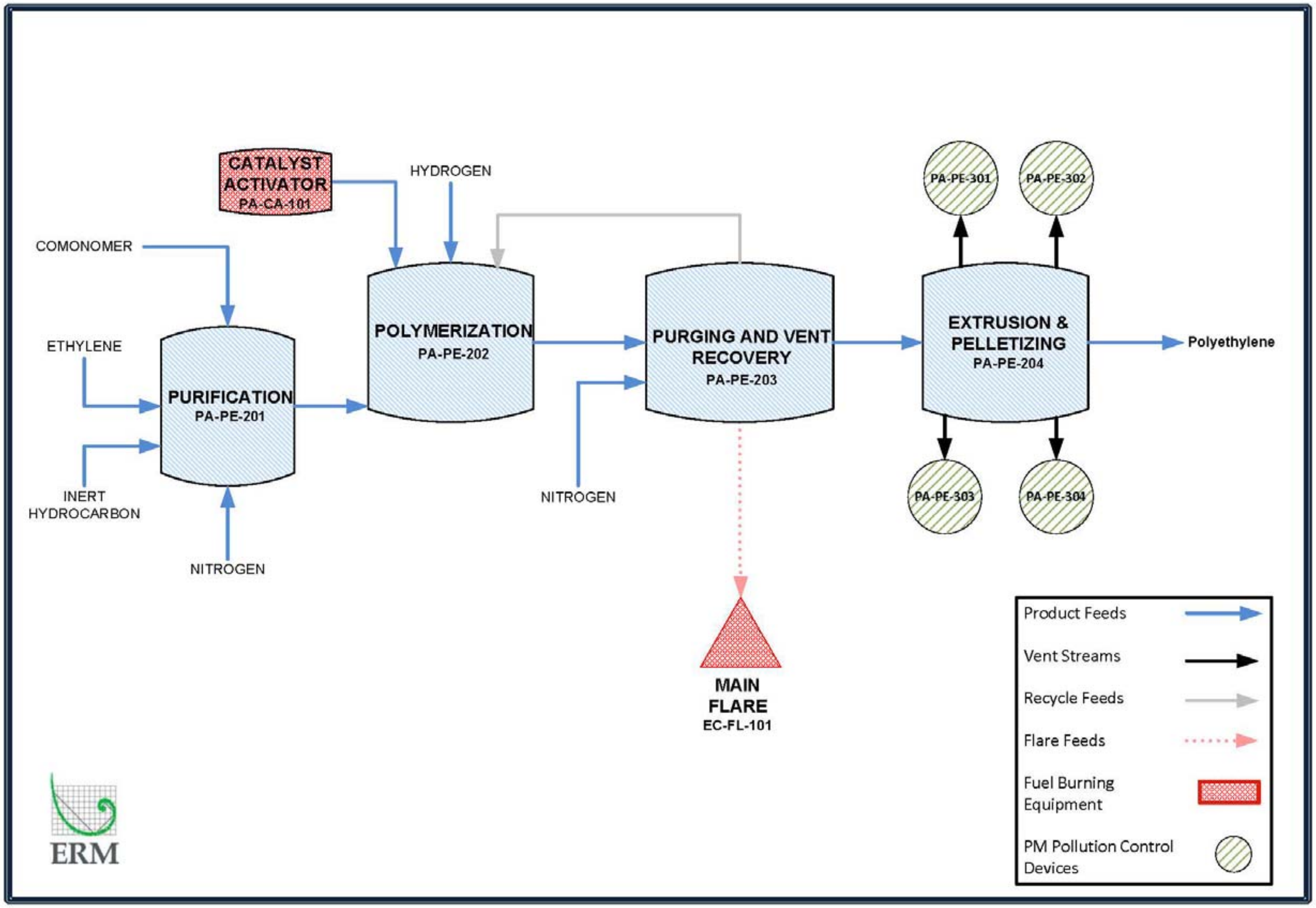


Figure 2-3B   PE Plant B Process Flow Diagram

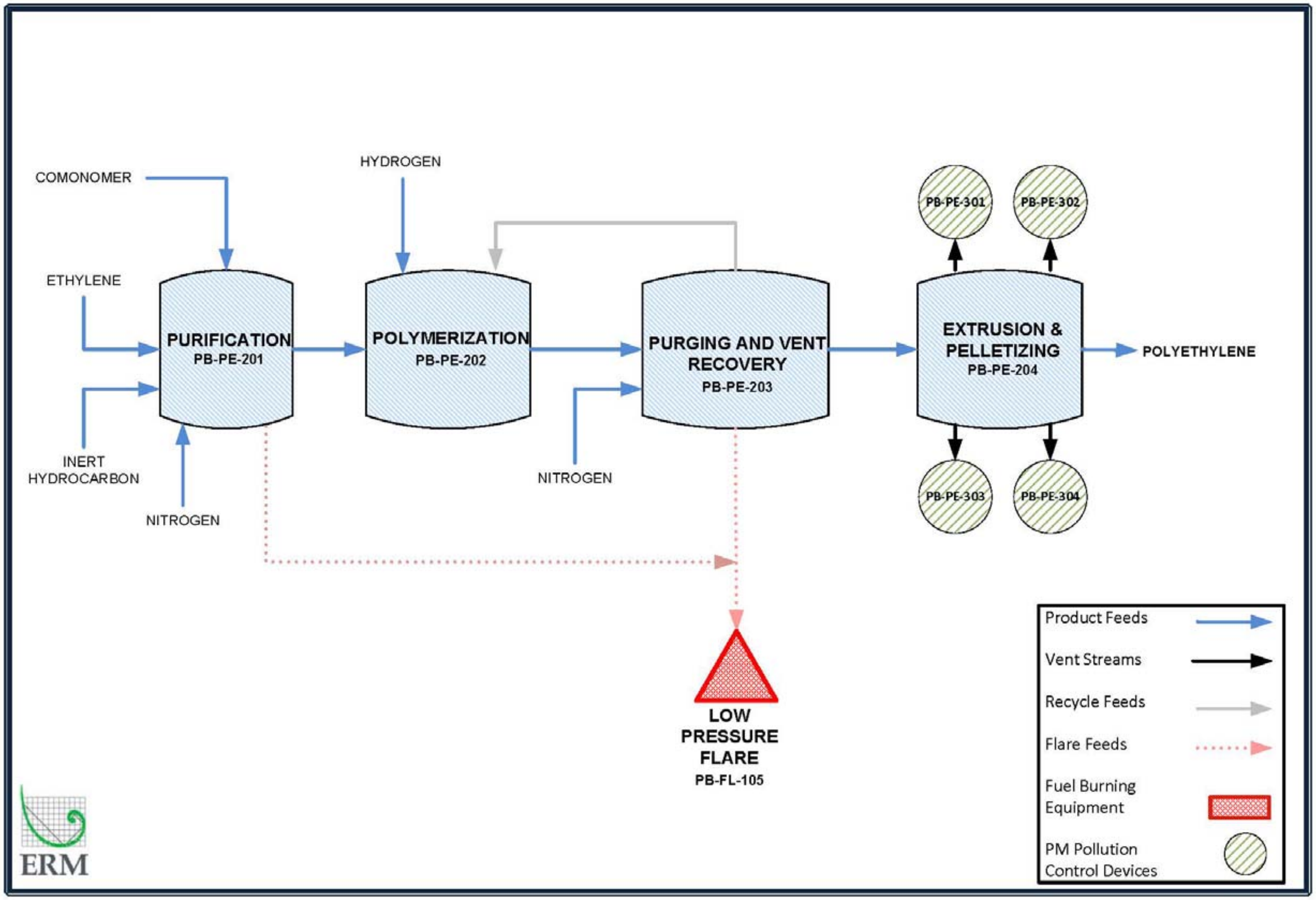
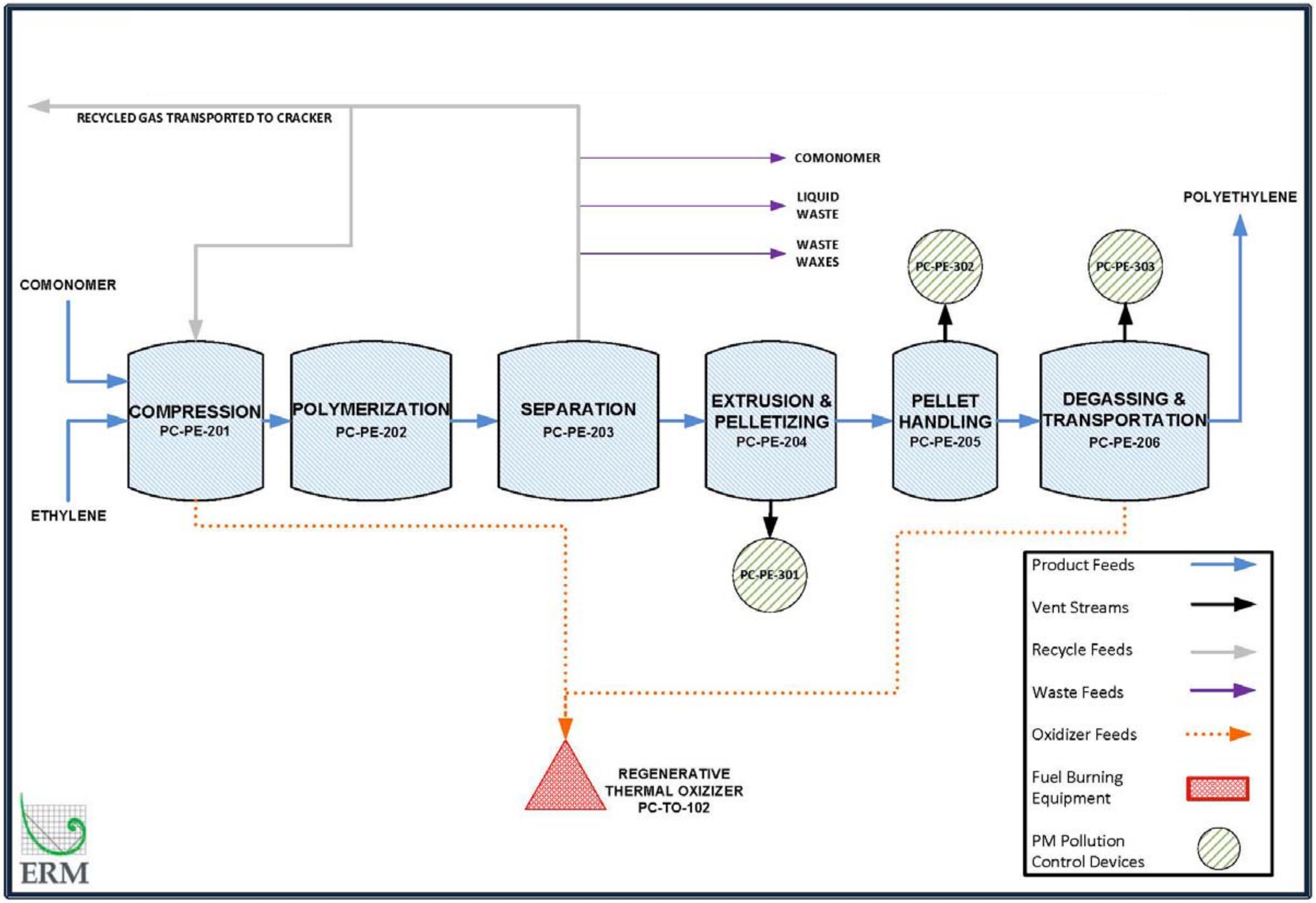


Figure 2-3C PE Plant C Process Flow Diagram



2.3 SUPPORT UTILITIES

2.3.1 Power Generation

The Project includes the construction and operation of one on site combustion turbine that will supply some or all of the necessary electricity for the facility. The plant will generate electricity by one natural gas fired GE 7EA combustion turbine, rated at 942.6 MMBtu/hr and an additional Heat Recovery Steam Generation (HRSG) unit, equipped with a steam turbine. An additional duct burner will be constructed for optional firing at a heat input of 346 MMBtu/hr. The HRSG unit will help recover heat from the combustion turbine exhaust gas and produce steam, which is sent to the steam turbine generator to produce additional electric power output.

The combustion turbine and the HRSG duct burner will share a common stack and will be equipped with a Selective Catalytic Reduction (SCR) system, at 80% control efficiency, to control all nitrogen oxide (NO_x) emissions. The combustion turbine will also incorporate a dry low-NOx combustor into the final design. The SCR involves the injection of aqueous ammonia (NH_3) into the exhaust gas streams. The ammonia reacts with NO_x in the exhaust gas streams and reduces it to elemental nitrogen (N_2) and water vapor (H_2O). The aqueous ammonia will be stored on site in storage tanks. The aqueous ammonia storage tanks will not normally vent to the atmosphere. They will be equipped with pressure relief valves that will only vent to atmosphere in the event of an emergency.

An oxidation catalyst will also be used to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions from the combustion turbine and HRSG combined. The oxidation catalyst will have a CO DRE of at least 80%. The combustion turbine and HRSG are assumed to operate continuously (8,760 hr/yr).

2.3.2 Auxiliary Boilers

Two natural gas-fired auxiliary boilers, each with a 206 MMBtu/hr rating, will be constructed and operated continuously (8,760 hr/yr) to supply any additional heat needed for operations at the ASCENT facility. The auxiliary boilers will be equipped with Ultra Low NOx Burners to control emissions.

2.3.3 *Storage Tanks*

The proposed facility will utilize a number of storage tanks for solid, liquid, and gaseous storage for process operations and material storage. The material stored in each tank will include, but not be limited to, caustic soda, sulfuric acid, 1-hexene, raw pyrolysis gas, ethane, propylene, inert hydrocarbons (e.g., isopentane), comonomers (e.g., vinyl acetate), diesel fuel, wastewater, ammonia, and compressor wash oil. A number of the storage tanks will be pressurized and will not have any associated emissions. All volatile organic liquids are controlled by either the cold flare or warm flare with a 98% VOC DRE. Storage tanks containing volatile liquids with a maximum true vapor pressure at storage conditions greater than or equal to 76.6 kPa will be provided with a closed vent system and control devices.

2.3.4 *Cooling Tower*

A wet, mechanical draft Cooling Tower will be used. Make-up water is added to the Cooling Tower as necessary to account for water evaporation. High efficiency drift eliminators are used to control particulate matter (PM) emissions from the Cooling Tower, with a maximum drift rate of 0.0005% of the total circulation rate.

The make-up cooling water for the Cooling Tower will come from the adjacent Ohio River. The Cooling Tower will operate continuously.

2.3.5 *Wastewater Treatment Plant*

The WWTP can be divided into three blocks: wastewater collection, effluent treatment plant (ETP), and waste reuse system and final discharge. All wastewater streams will be transferred by means of collection and lifting systems (effluent basins and pumping stations). All effluent pumps and equipment will be driven by electrical motors; therefore, they will be dependent on a continuous electricity supply.

A complete process flow diagram is included in Appendix C of the permit application. The ETP will consist of the following main sections:

- Primary Treatment (De-Oiling and Chemical-Physical (CPI) Treatment);

- Secondary Treatment (Biological Treatment);

- Sludge Dewatering;
- Treated Water Reuse;
- Salt Concentration (Optional); and
- Sludge Drying.

The ETP is fed by seven separate influent streams: oily wastewater from the Cracker Plant, cooling water blow-down streams, pretreated spent caustic, flare hydraulic seal from outside battery limits, wastewater from warehouse and workshop facility, sanitary sewage, and oily rain water. The CPI receives all wastewater influent streams except the sanitary sewage. Oily water influents are first collected in an open sump before transfer to the CPI. During peak flows or rain events, excess flows are diverted to the oily water storage tanks where cooling water blow-down is also stored. The oily water storage tanks aid in flow equalization to prevent surge through the CPI.

Once oil is separated from the water in the CPI, skimmed oil is collected for disposal, sludge is sent to the sludge drying unit, and wastewater is routed to the dissolved air flotation (DAF). A coagulant is added in a mixing zone at the start of the DAF unit to promote solids removal. Sludge collected from the DAF is skimmed and sent to the sludge drying unit. Wastewater from the DAF is sent to an equalization tank prior to entering biological treatment. Sanitary sewage is introduced at the biological treatment system. A two-stage biological treatment system is utilized, aerated biological treatment and membrane biological reactor (MBR). Sludge from the MBR is sent to the sludge drying unit. The final treated effluent from the MBR is discharged to the river. Fugitive emissions from the wastewater treatment plant are discussed in Section 3.5.5.

2.3.6 *Emergency Generators*

The proposed facility will include the use up to nine (9) emergency generators to act as a backup energy supply. There will be seven (7) generators rated at 2800 kW and two (2) generators rated at 350 kW. The Ethane Cracker Plant and each polyethylene plant will have one dedicated 2800 kW emergency generator. The other 2800 kW emergency generators are meant to support the combustion turbine, boilers, and wastewater treatment plant. All nine generators are fired on Ultra Low Sulfur Diesel (ULSD) fuel with a maximum sulfur content of 15 ppm. The smaller 350 kW generators will act as a backup power supply for utility operations such as product storage and the cooling water area.

The emergency generators will only be used for unplanned emergencies or power curtailment and will be limited to 100 hours of non-emergency use for maintenance and testing.

2.3.7 Fire Water Pump Engines

The proposed facility will include three (3) emergency Fire Water Pump engines associated with the planned fire water suppression system. The emergency engines will have a maximum rating of 485 kW and will burn ULSD. The engines will be limited to 100 hours of non-emergency use (e.g., maintenance and testing).

2.3.8 Loading Racks

Bulk loading racks will be used for the loading and unloading of all material for the proposed facility. The loading racks will control VOC and HAPS emissions using the cold flare or warm flare depending on the type of liquid transfer. Cold and warm liquid storage will be managed via separate loading/unloading racks.

3.0 PROJECT EMISSIONS

3.1 OVERVIEW AND METHODOLOGY

Potential emissions from new and modified sources in attainment areas are evaluated through the New Source Review (NSR) Prevention of Significant Deterioration (PSD) program. The Project's potential air emissions were evaluated to ensure that the Project would meet all applicable regulatory thresholds and limits.

Potential air emissions for this application were estimated using various calculation methodologies including vendor provided data specifications, EPA, State agency or industry specific emission factors (e.g., US EPA's Compilation of Air Pollutant Emission Factors (AP-42) publication), material balances, New Source Performance Standards (NSPS) emission standards, EPA's Water9 and TANKS 4.09D programs, and/or engineering calculations. Supporting emissions calculations are provided in Appendix D of the permit application. The locations of the point emission sources and primary project components are provided in Figure B-3 and B-4 of Appendix B of the permit application.

3.2 FACILITY WIDE EMISSIONS

The facility wide Potential-to-Emit (PTE) air emissions for all regulated criteria pollutants or their precursors, greenhouse gasses (GHGs), and total hazardous air pollutants (HAPs) can be found in Table 3-1. The subsequent subsections provide a detailed explanation on the methodology used to estimate all potential emissions.

Based on the potential emissions reported in this application, the Project has the potential to be a major PSD source for the following air pollutants:

- Nitrogen oxides (NO_x);
- Carbon Monoxide (CO);
- Volatile Organic Compounds (VOCs);

- Particulate matter (PM/PM10/PM2.5);
- HAPs (Hexane and Total); and
- GHGs (expressed on a carbon dioxide equivalent (CO_2e) basis).

3.2.1 Criteria Pollutants

The USEPA has defined concentration-based NAAQS for several pollutants, which are set at levels considered protective of the public health and welfare. Specifically, the NAAQS have been defined for six (6) "criteria" pollutants, including PM, SO_2, CO, nitrogen oxides (NO_x), ozone, and lead (Pb). The three (3) forms of particulate matter regulated are total suspended particulate (known as PM), PM10, and PM2.5. The production of Sulfuric Acid Mist (SAM) can also occur from the burning of sulfur containing fuels. Natural gas has a relatively low sulfur content; however, SAM emissions can still be generated. SAM emissions are captured under the PM, PM10, and PM2.5 totals. For all fuel burning equipment, this application conservatively assumes 0.02 grains/scf for short-term sulfur content of natural gas and 0.0022 grains/scf for annual average sulfur content of natural gas.

Table 3-1 Facility Wide Potential Emissions

Emissions Area	Equipment Type	Criteria Pollutants (tons/yr) NOx	CO	SO_2	VOC	PM	PM10	PM2.5	Lead	HAPS (tons/yr)	CO_2e (tons/yr)
Ethane Cracker	Pyrolysis Furnaces – Normal Operation (5)	521	107	9.97	26.1	79.5	79.5	79.5	8.31E-03	31.6	569,577
	Pyrolysis Furnaces – Decoking Operation (1)	31.3	6.41	0.598	1.56	15.6	15.6	15.6	4.98E-04	1.89	36,815
	Thermal Oxidizer Burner	22.8	22.8	0.335	3.07	1.11	4.29	4.29	2.79E-04	1.06	67,127
	Cracker Process - Oxidizer	-	-	-	20.2	-	-	-	-	2.70	489,307
	Main Flare Pilot (2)	0.244	1.31	0.002	0.019	0.069	0.069	0.069	1.76E-06	0.007	425
	Ethylene Storage Flare Pilot (2)	0.119	0.641	0.001	0.009	0.033	0.033	0.033	8.59E-07	0.003	207
	Cracker Storage Flare Pilot (2)	0.119	0.641	0.001	0.009	0.033	0.033	0.033	8.59E-07	0.003	207
	Oxygen Flare Pilot (2)	0.060	0.321	0.001	0.005	0.017	0.017	0.017	4.29E-07	0.002	104
	Ethane Cracker Plant Fugitives	-	-	-	121	-	-	-	-	-	3,033
Polyethylene Plants	RTO Burner	3.50	7.21	0.052	0.472	0.170	0.660	0.660	4.29E-05	0.163	10,367
	PE Process – Oxidizer		-	-	13.1	-	-	-	-	-	1,632
	PE Plants Fugitives	-	-	-	208	-	-	-	-	8.77	891
	Low Pressure Flare Pilot (2)	0.119	0.641	0.001	0.009	0.033	0.033	0.033	8.59E-07	0.003	207
	Catalyst Activator	2.15	3.61	0.026	0.236	0.085	0.330	0.330	2.15E-05	0.082	5,184
	Material Handling	-	-	-	-	11.9	11.9	11.9	-	-	-
Support Utilities	Auxiliary Boilers (2)	36.1	63.2	1.06	2.35	3.75	3.75	3.75	8.85E-04	3.36	213,563
	GE 7EA Gas Turbine	31.7	51.3	14.0	44.0	21.0	21.0	21.0	-	4.24	576,624
	HRSG Duct Burner	28.1	28.1	0.891	8.17	2.94	11.4	11.4	7.43E-04	2.82	336,053
	Wastewater Treatment Plant	-	-	-	1.69	-	-	-	-	1.69	-
	Loading Racks	-	-	-	11.0	-	-	-	-	2.69	-
	Storage Tanks Total	-	-	-	2.81	-	-	-	-	0.828	-
	Emergency Generators (9)	14.2	7.80	1.05	0.344	0.474	0.451	0.451	-	0.006	572
	Fire Water Pumps (3)	0.310	0.269	0.035	0.022	0.017	0.022	0.022	-	4.83E-04	19.6
	Cooling Tower	-	-	-	67.5	5.02	4.64	0.123	-	-	-
Total tons per year (TPY)		**692**	**301**	**28.1**	**532**	**142**	**154**	**149**	**0.011**	**61.9**	**2,311,914**

3.2.2 *Hazardous Air Pollutant Emissions*

Appropriate AP-42 sections provide emission factors for organic and metal compounds resulting from combustion, some of which are HAPs. Estimated HAP emissions from the proposed Project are summarized in Table 3-2. A facility is considered a "major" source of HAPs if it has the potential to emit 10 tpy or more of any individual HAP, or 25 tpy or more of all HAPs combined. As shown in Table 3-10, maximum emissions of any single HAP are 47.5 tpy (hexane), and estimated total HAP emissions from the Project are 61.2 tpy. Because the emissions of hexane exceed 10 tpy and the total HAPs are greater than 25 tpy, the Project is considered a major source of HAPs.

Table 3-2 Hazardous Air Pollutants (HAPS) Potential Emissions

	tons/yr						
Pollutant	**Fuel Combustion**	**Tanks**	**Loading Racks**	**Waste Combustion**	**WWTP**	**Fugitives**	**Facility Wide Total**
1,3-Butadiene	3.56E-03	-	-	-	-	-	3.56E-03
2-Methylnaphthalene	5.18E-04	-	-	-	-	-	5.18E-04
3-Methylchloranthrene	3.88E-05	-	-	-	-	-	3.88E-05
7,12-Dimethylbenz(a)anthracene	3.45E-04	-	-	-	-	-	3.45E-04
Acenaphthene	7.28E-05	-	-	-	-	-	5.58E-05
Acenaphthylene	1.06E-04	-	-	-	-	-	7.26E-05
Anthracene	6.10E-05	-	-	-	-	-	5.64E-05
Acetaldehyde	3.31E-01	-	-	-	-	-	0.165
Acrolein	5.29E-02	-	-	-	-	-	0.026
Benz(a)anthracene	4.37E-05	-	-	-	-	-	4.13E-05
Benzene	0.149	0.548	0.832	2.13	1.69	-	5.30
Benzo(a)pyrene	2.78E-05	-	-	-	-	-	2.68E-05
Benzo(b)fluoranthene	4.68E-05	-	-	-	-	-	4.28E-05
Benzo(g,h,i)perylene	3.00E-05	-	-	-	-	-	2.79E-05
Benzo(k)fluoranthene	4.04E-05	-	-	-	-	-	3.96E-05
Butadiene	-	-	1.40	-	-	-	1.40
Chrysene	4.99E-05	-	-	-	-	-	4.44E-05
Dibenzo(a,h)anthracene	2.85E-05	-	-	-	-	-	2.72E-05
Dichlorobenzene	2.59E-02	-	-	-	-	-	0.026

	tons/yr						
Pollutant	**Fuel Combustion**	**Tanks**	**Loading Racks**	**Waste Combustion**	**WWTP**	**Fugitives**	**Facility Wide Total**
Ethylbenzene	2.64E-01	0.001	0.017	-	-	-	0.150
Fluoranthene	9.55E-05	-	-	-	-	-	8.01E-05
Fluorene	1.59E-04	-	-	-	-	-	1.10E-04
Formaldehyde	7.48E+00	-	-	-	-	-	4.55
Hexane	3.88E+01	6.54E-05	-	0.182	-	8.55	47.5
Indeno(1,2,3-cd)pyrene	4.19E-05	-	-	-	-	-	4.03E-05
Naphthalene	2.48E-02	-	-	-	-	-	0.019
Methanol	0.00E+00	-	-	-	-	0.220	2.20E-01
Phenanathrene	6.67E-04	-	-	-	-	-	5.17E-04
Phenol	0.00E+00	-	-	-	4.27E-04	-	4.27E-04
Propylene Oxided	2.39E-01	-	-	-	-	-	0.120
Pyrene	1.36E-04	-	-	-	-	-	1.22E-04
Styrene	-	0.003	0.083	0.125	-	-	0.211
Toluene	1.15E+00	0.023	0.125	0.258	-	-	1.02
Vinyl Acetate	0.00E+00	0.251	0.220	-	-	-	0.472
Arsenic	4.31E-03	-	-	-	-	-	4.31E-03
Barium	9.49E-02	-	-	-	-	-	0.095
Beryllium	2.59E-04	-	-	-	-	-	2.59E-04
Cadmium	2.37E-02	-	-	-	-	-	0.024
Chromium	3.02E-02	-	-	-	-	6.89E-06	0.030
Cobalt	1.81E-03	-	-	-	-	-	1.81E-03
Copper	1.83E-02	-	-	-	-	-	0.018
Manganese	8.19E-03	-	-	-	-	-	8.19E-03
Mercury	5.61E-03	-	-	-	-	-	5.61E-03
Molybdenum	2.37E-02	-	-	-	-	-	0.024
Nickel	4.53E-02	-	-	-	-	-	0.045
Selenium	5.18E-04	-	-	-	-	-	5.18E-04
Vanadium	4.96E-02	-	-	-	-	-	0.050
Xylenes	5.30E-01	1.04E-03	1.66E-02	7.72E-03	-	-	0.290
Zinc	6.25E-02	-	-	-	-	-	0.063
TOTAL PAH	1.97E-02	-	-	-	2.17E-05	-	9.89E-03
					Total HAPS (tpy)		**61.9**

3.2.3 *Greenhouse Gas Emissions*

Potential GHG emissions [i.e., CO_2, methane (CH_4) and nitrous oxide (N_2O)] were estimated for all combustion sources associated with the Project. GHG emissions on an individual and carbon dioxide equivalent (CO_2e) basis are summarized in Table 3-3. In 40 CFR 98, USEPA defines CO_2e emissions to be equivalent to CO_2 emissions plus 25 times the CH_4 emissions plus 298 times the N_2O emissions, utilizing the applicable Global Warming Potentials (GWPs).

Table 3-3 Greenhouse Gases Potential Emissions

Emissions Area	Equipment Type	CO_2e (tons/yr)	Primary GHGs (tons/yr)		
			Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)
Ethane Cracker	Pyrolysis Furnaces – Normal Operation (5)	569,577	565,453	38.2	10.63
	Pyrolysis Furnaces – Decoking Operation (1)	36,815	36,567	2.29	0.64
	Thermal Oxidizer Burner	67,127	66,988	1.28	0.36
	Cracker Process - Oxidizer	489,307	489,307	-	-
	Main Flare Pilot (2)	425	423	0.008	0.008
	Ethylene Storage Flare Pilot (2)	207	206	0.004	0.004
	Cracker Storage Flare Pilot (2)	207	206	0.004	0.004
	Oxygen Flare Pilot (2)	104	103	0.002	0.002
	Ethane Cracker Plant Fugitives	3,033	-	121	-
Polyethylene Plants	RTO Burner	10,367	10,306	0.20	0.19
	PE Process – Oxidizer	1,632	1,632	-	-
	PE Plant Fugitives and Flares	891	-	35.6	-
	Low Pressure Flare Pilot (2)	207	206	0.004	0.004
	Catalyst Activator	5,184	5,153	0.099	0.094
	Material Handling	-	-	-	-
Support Utilities	Auxiliary Boilers (2)	213,563	212,301	4.07	3.89
	GE 7EA Gas Turbine	576,624	572,834	3.96	12.39
	HRSG Duct Burner	336,053	332,258	140.5	0.95
	Wastewater Treatment System	-	-	-	-
	Loading Racks	-	-	-	-
	Storage Tanks Total	-	-	-	-
	Emergency Generators (9)	572	571.56	0.03	-

Emissions Area	Equipment Type	CO_2e (tons/yr)	Primary GHGs (tons/yr) Carbon Dioxide (CO_2)	Methane (CH_4)	Nitrous Oxide (N_2O)
	Fire Water Pumps (3)	19.6	19.59	0.0020	-
	Cooling Tower	-	-	-	-
Total tons per year (TPY)		**2,311,914**	**2,294,534**	**348**	**29.2**

Notes:

(1) Emissions estimated based on 40 CFR 98, Subpart A Global Warming Potentials.

$CO_2e = CO_2$ emissions + 25(CH_4 emissions) + 298(N_2O emissions)

3.3 ETHANE CRACKER PLANT EMISSIONS

The emission sources associated with the Ethane Cracker Plant are presented in Table 3-4. The emission sources include six (6) pyrolysis furnaces, one thermal oxidizer, four flares with duplicative pilot burners, and fugitive/process emissions generated from normal operations. The following section describes the estimated potential emissions for each discrete emission source and the methodology used to calculate the associated emissions.

Table 3 -4 Ethane Cracker Emission Sources

Emission Unit	**Source Description**	**Emission Type**	**Size/Capacity**	**Fuel(s)[1]**	**Proposed Maximum Operations**
EC-PF-101	Pyrolysis Furnace #1	Criteria, GHG, and HAPs	396.8 MMBtu/hr	Natural gas (NG)/Tail gas (TG) Blend	8,760 hr/yr
EC-PF-102	Pyrolysis Furnace #2	Criteria, GHG, and HAPs	396.8 MMBtu/hr	NG/TG Blend	8,760 hr/yr
EC-PF-103	Pyrolysis Furnace #3	Criteria, GHG, and HAPs	396.8 MMBtu/hr	NG/TG Blend	8,760 hr/yr
EC-PF-104	Pyrolysis Furnace #4	Criteria, GHG, and HAPs	396.8 MMBtu/hr	NG/TG Blend	8,760 hr/yr
EC-PF-105	Pyrolysis Furnace #5	Criteria, GHG, and HAPs	396.8 MMBtu/hr	NG/TG Blend	8,760 hr/yr

Emission Unit	Source Description	Emission Type	Size/Capacity	Fuel(s)[1]	Proposed Maximum Operations
EC-PF-106	Pyrolysis Furnace #6	Criteria, GHG, and HAPs	119 MMBtu/hr	NG/TG Blend	8,760 hr/yr
EC-TO-101	Cracker Thermal Oxidizer	Criteria, GHG, and HAPs	130 MMBtu/hr	NG	8,760 hr/yr
EC-PE-101	Cracker Process - Oxidizer Emissions	VOC, GHG	2,097 kg/hr[2]	N/A	8,760 hr/yr
EC-PE-102	Cracker Process-Fugitive Emissions	VOC, GHG	N/A	N/A	8,760 hr/yr
EC-FL-101	Main Flare Pilots	Criteria, GHG, and HAPs	0.82 MMBtu/hr total	NG	8,760 hr/yr
EC-FL-102	Ethylene Storage (Cold) Flare Pilots	Criteria, GHG, and HAPs	0.4 MMBtu/hr total	NG	8,760 hr/yr
EC-FL-103	Storage Flare Pilots	Criteria, GHG, and HAPs	0.4 MMBtu/hr total	NG	8,760 hr/yr
EC-FL-104	Oxygen Flare Pilots	Criteria, GHG, and HAPs	0.2 MMBtu/hr total	NG	8,760 hr/yr

Notes:

(1) Fuels used for the equipment will largely be pipeline quality natural gas (NG) with the exception of the six cracking furnaces, which will use a combination of NG and recycled tail gas (TG).

(2) Waste inlet flow rates for the cracker thermal oxidizer are based on a conservative estimate for the normal continuous flow plus the intermittent gasoline max flow.

3.3.1 *Pyrolysis Furnaces (Normal Operation and Decoking)*

The potential emissions for NO_x, CO, PM, CO_2, and VOC from the six pyrolysis furnaces were calculated based on vendor specified emission data for Ultra-Low NO_x Burners (ULNBs). All other remaining emissions were calculated based on AP-42 Chapter 1.4 emission factors for natural gas or more stringent BACT determinations where applicable. All PM emissions are assumed to be less than 1.0 micron in aerodynamic diameter.

During normal operations, five furnaces will be fired at total heat input of 1,984 MMBtu/hr and one furnace will be held on hot stand-by at 30% load. The heat for hot stand-by operations will be supplied by auxiliary heat sources. The fuel fired by the furnaces will be a mixture of recycled tail gas and natural gas. Table 3-3 presents the composition breakdown of the fuel gas mixture. Compared to pipeline quality natural gas, the fuel mixture will be a hydrogen rich gas. This correlates to a lower heating value of 523 Btu/scf. This heating value was used for all permitting and emission estimating purposes regarding the six pyrolysis furnaces. The heating value was calculated as a weighted mean based on the mole percent of each constituent; the weighted values for each constituent can be found in Table 3-5.

It is expected that natural gas will be the primary fuel used during initial unit startup and during any restarts following a complete plant shut down.

Table 3 -5 Cracker Fuel Gas Mixture Heating Value

Constituent	Fraction	Gross Heating Value[1] (Btu/scf)	Weighted Values[2]
H_2	0.750	349	262
CO	5.00E-04	347	0.174
CH_4	0.239	1,053	251
C_2H_4	2.63E-03	1,675	4.41
C_2H_6	3.02E-03	1,862	5.62
CO_2	7.00E-05	347	0.02
N_2	4.86E-03	0.0	0.0
		Weighted Total =	**523** Btu/scf

Notes:

(1) Source: Babcock & Wilcox Co, *Steam Its Generation and Use.* September 18, 2007
(2) Nitrogen is an inert gas that will not react and therefore Nitrogen has no heating value

For emission estimating purposes, this application and supporting calculations assumes the following maximum fuel combustion operating schedule for the six pyrolysis furnaces;

- Five (5) furnaces fired at full load (1,984 MMBtu/hr) for 8,760 hr/yr; and

- One (1) furnace fired at 30% load (119 MMBtu/hr) during either hot stand-by or decoking operations.

In addition, each furnace must undergo decoking operations approximately every 60 to 70 days (or five to six times decoking events per year). For conservative measures, this application assumes that each furnace will undergo 12 decoking events each year. At 12 hours per decoking event, this correlates to 864 hours of decoking firing combined for all six furnaces.

In addition to the fuel combustion emissions associated with each decoking event at 30% load, GHG emissions from the decoking of the furnaces consist of CO_2 emissions from the combustion of the coke build-up. Furthermore, this application assumes some potential PM emissions occur from removal of the coke build-up. Based on industry knowledge, the potential emissions estimated the pounds of PM and pounds of carbon per decoking event to be 300 and 20,000 pounds, respectively. The coke material carbon is assumed to be oxidized into CO_2 emissions during each decoking event. All PM from decoking is assumed to be less than 2.5 microns.

The potential emissions presented in Table 3-6 represent the maximum short term and annual emissions per furnace, showing emissions associated with normal and decoking/hot stand-by operations. No startup or shutdown emissions are accounted for in the emissions estimates for the pyrolysis furnaces as the units are designed to operate continuously. Startup or shutdown of these units are not considered to be part of normal operations.

Table 3 -6 Pyrolysis Furnaces Potential Emissions per Furnace

	Normal Operation		**Decoking/Hot Stand-by**	
Regulated Pollutant	**Maximum Short Term Emission Rate (lb/hr)**	**Maximum Annual Emissions Rate (tons/yr)**	**Maximum Short Term Emission Rate (lb/hr)**	**Maximum Annual Emissions Rate (tons/yr)**
NO_x	23.8	104	7.14	31.3
VOC	1.19	5.21	0.357	1.56
CO	4.88	21.4	1.46	6.41
SO_2	0.455	1.99	0.137	0.598
PM/PM10/PM2.5	3.57	15.6	3.54	15.5
Pb	3.79E-04	1.66E-03	1.14E-04	4.98E-04

SAM	0.061	0.267	0.018	0.080
CO_2e	26,008	113,915	8,405	36,815

3.3.2 *Ethane Cracker Plant Thermal Oxidizer*

The Ethane Cracker Plant Thermal Oxidizer will be designed with a radiant section, for the combustion of waste in-let streams, and a natural gas burner rated at 130 MMBtu/hr. The emissions generated from the unit are twofold; emissions generated from natural gas combustion and emissions generated from the waste combustion. The natural gas burner will be equipped with Low NO_x Burners (LNBs) and the radiant section will be designed to have a 99.9% DRE for all VOCs and organic HAPS. The thermal oxidizer will receive a normal continuous feed comprised of water containing 1-hexene and C_{10}/C_{11} compounds. In addition to the continuous waste streams, intermittent waste streams from the Ethane Cracker will be sent to the oxidizer for reduction that will include, wash oil from the CGC, pyrolysis gasoline, and peak water. The compositions of the streams sent to the thermal oxidizer are included with the emissions calculations provided in Appendix D of the permit application.

The emissions associated with the natural gas burner were calculated based on AP-42 Chapter 1.4 emission factors. The emissions associated with the radiant section were calculated based on a material balance for inlet waste flow rates. All organic waste constituents are assumed to be oxidized to CO_2 at a 99.9% efficiency. The maximum operating schedule was assumed 8,760 hr/yr for both the fuel and waste combustion. Table 3-7 presents the combined emissions associated with both the fuel and waste combustion. Waste inlet flow rates for the oxidizer are based on a conservative estimate considering a continuous flow of both the normal operations flow plus the pyrolysis gasoline flow (which is typically an intermittent stream). The pyrolysis gasoline intermittent stream was selected because of the higher content of VOCs.

Table 3-7 Thermal Oxidizer Potential Emissions

Regulated Pollutant	Maximum Short Term Emission Rate (lb/hr)	Maximum Annual Emissions Rate (tons/yr)
NO_x	5.20	22.8
VOC	5.32	23.3
CO	5.20	22.8
SO_2	0.076	0.335
PM (filterable)	0.242	1.06
PM10/PM2.5 (total)	0.969	4.24
Pb	6.37E-05	2.79E-04
SAM	0.010	0.045
CO_2e	127,040	556,434

Notes:

(0) Combined emissions for fuel and waste combustion

3.3.3 *Ethane Cracker Plant Fugitive Emissions*

Fugitive emissions generated by Ethane Cracker Plant originate from equipment leaks associated the total number of seals, valves, and connection points within the entire Ethane Cracker Plant. Emission factors and control efficiencies are based on the EPA Protocol for Equipment Leak Emission Estimates (SOCMI) and were used to estimate all potential fugitive VOC leak emissions. The SOCMI emissions factors are conservative and should be considered uncontrolled fugitive emissions with a leak detection of 10,000 ppmv. However, the proposed Project will be subject to Leak Detection and Repair (LDAR) requirements under 40 CFR Part 60 Subpart VVa. ASCENT's review of resources addressing the control of emissions identified the Texas Commission of Environmental Quality (TCEQ). Due to the large number of chemical plants in Texas, the State has developed a series of guidance documents addressing common emission sources including an in-State regulatory LDAR program, similar to the Subpart Vva requirements. As such, each component type was assigned a control efficiency based on the Control Efficiencies for TCEQ Leak Detection and Repair Programs (28VHP) guidance document. For example, valves in a heavy liquid service may be given a 97% reduction credit if monitored at 500 ppmv.

For emission estimating purposes, all equipment contents are conservatively assumed to be 100% VOC and are assumed to operate at 8,760 hr/yr. To estimate GHG emissions, all VOCs were assumed to be equivalent to methane (CH_4). Table 3-8 presents the short term and annual fugitive emissions associated with the Ethane Cracker Plant.

Table 3-8 Ethane Cracker Plant Fugitives Potential Emissions

Emission Source	Maximum Short Term Emission Rate [1] (lb/hr)	Maximum Annual Emissions Rate [1] (tons/yr)
Seals/Pumps	1.60	7.02
Valves	2.62	11.5
Connections	23.5	103
Total	**27.7**	**121**

Notes:
(1) The total amount of hydrocarbon leaks from the process were used to calculate both total VOC emissions and total GHG emissions (from methane). The total CO2e emissions from fugitives are estimated at 25 times the value of the methane total emissions based on EPA's Global Warming Potential factors approved in 40 CFR Part 98.

3.3.4 Ethane Cracker Plant Flare Emissions

The emissions generated by the main flare, ethylene storage flare, product storage flare, and oxygen flare pilot systems associated with the Ethane Cracker Plant, were estimated based on emission factors derived from AP-42 Chapter 1.4 for natural gas external combustion. All flare pilots were assumed to operate at 8,760 hr/yr. Startup and shutdown of the flare pilots is considered outside of normal operations.

3.4 POLYETHYLENE PLANTS EMISSIONS

The emission sources associated with the three PE plants are presented in Table 3-9. The following section describes the estimated potential emissions for each emission source associated with the three PE plants and the methodology used to calculate all emissions. Fuel burning equipment associated with the PE plants include the RTO burner; the catalyst activator; and the gas pilot associated with the low pressure flare.

In addition to fuel burning equipment, each of the three plants will have associated vent and fugitives emissions (VOCs) and material handling emissions (PM) discussed more below.

Table 3 -9 Polyethylene Plants Emission Sources

Emission Unit	Source Description	Emission Type	Size/Capacity	Fuel(s)	Proposed Maximum Operations
PC-TO-102	Regenerative Thermal Oxidizer	Criteria, GHG, and HAPS	20 MMBtu/hr	NG	8,760 hr/yr
PB-FL-105	Low Pressure Flare Pilots	Criteria, GHG, and HAPS	0.4 MMBtu/hr total	NG	8,760 hr/yr
PA-CA-101	Catalyst Activator	Criteria, GHG, and HAPS	10 MMBtu/hr	NG	8,760 hr/yr
PC-PE-103	Process – Oxidizer Emissions	VOC and CO_2	136.0 kg/hr[1]	N/A	8,760 hr/yr
PA-FE-101	PE Plant A Fugitive/Vent Emissions	VOC, PM, NO_x, CO (Fugitive/vents)	N/A	N/A	8,760 hr/yr
PC-FE-101	PE Plant C Fugitive/Vent Emissions	VOC, PM, NO_x, CO (Fugitive/vents)	N/A	N/A	8,760 hr/yr
PB-FE-101	PE Plant B Fugitives/Vent Emissions	VOC, PM, NO_x, CO (Fugitive/vents)	N/A	N/A	8,760 hr/yr
PA-MH-101	PE Plant A Material Handling Emissions	PM	N/A	N/A	Varies
PB-MH-101	PE Plant B Material Handling Emissions	PM	N/A	N/A	Varies
PC-MH-101	PE Plant C Material Handling Emissions	PM	N/A	N/A	Varies

Notes:

(1) Inlet flow rates for the RTO are based on maximum waste flow rates from both the extrusion/pelletizing and waste oil storage sections.

3.4.1 *Regenerative Thermal Oxidizer and Catalyst Activator*

The RTO will be designed with a waste oxidation chamber (i.e. radiant section), a heat exchanger, and a natural gas-fired LNB rated at 20 MMBtu/hr. The radiant section will receive waste gas streams generated by Plant C operations, including streams from the extrusion/pelletizing section and the waste oil storage. The composition for each stream can be found in Appendix D of the permit application. The radiant section of the RTO will be designed to have a DRE of at least 99 % for all VOCs and organic HAPS. Table 3-4 presents the short term and annual emissions for both the fuel and waste combustion associated with the RTO. The catalyst activator will be equipped with a natural gas-fired LNB rated at 10 MMBtu/hr.

The emissions generated by the two gas-fired LNBs, were calculated based on emission factors derived from AP-42 Chapter 1.4. The emissions associated with the RTO radiant section were calculated based on a material balance for inlet flow rates. All organic waste constituents are assumed to be oxidized to CO_2 at 99% efficiency. The maximum operating schedule of the RTO and the catalyst activator is assumed to be 8,760 hr/yr. Table 3-10 presents the combined emissions associated with both the fuel and waste combustion of the RTO. The maximum flow scenario was used for the RTO's waste inlet flow rates to ensure a conservative emission estimate.

Tabled 3-10 Regenerative Thermal Oxidizer Potential Emissions

Regulated Pollutant	Maximum Short Term Emission Rate [1] (lb/hr)	Maximum Annual Emissions Rate [1] (tons/yr)
NO_x	0.800	3.50
VOC	3.11	13.6
CO	1.65	7.21
SO_2	0.012	0.052
PM10/PM2.5 (total)	0.149	0.653
PM (filterable)	0.037	0.163
Pb	9.80E-06	4.29E-05
SAM	1.59E-03	6.95E-03
CO_2e	2,740	11,999

Notes:
(1) Combined emissions for fuel and waste combustion

3.4.2 *Polyethylene Plants Fugitive and Flare Emissions*

All three PE plants will be connected to the main flare for any unplanned over pressuring events. Emergency events are not predictable and emissions for these types of occurrences are not considered in the facility potential to emit. Normal operation (continuous or intermittent) venting can occur from each PE plant. These emissions are discussed below.

Plant A vent streams are sent to the main flare for a control efficiency of 98 %. There is no alternative dedicated control device for Plant A. Waste streams generated by Plant C operations will be sent to the RTO, which will be designed to have a DRE of 99 %, to capture non-continuous off-gassing events that cannot return to the ethane cracker plant due to high oxygen content. These emissions are captured in the RTO discussion. Because the product stream for the Plant C process is primarily ethylene, any upsets in this process are typically recycled back to the furnaces as an acceptable fuel. Plant B will be equipped with a flare to control low pressure vent emissions at a 98 % control efficiency. In the event the low pressure flare is out of service, Plant B can bypass the low pressure flare and utilize the main flare.

Each plant may also generate fugitive emissions that occur from unit operations. Fugitive emissions are emitted directly to the atmosphere under off-gassing operations.

Table 3-11 presents the total fugitive and vent emissions for all three polyethylene plants not already captured from the RTO emissions.

Table 3-11 Polyethylene Plants Fugitive Emissions

Regulated Pollutant	**Plant A (tons/yr)**	**Plant C (tons/yr)**	**Plant B (tons/yr)**	**Total (tons/yr)**
VOC	184	11.4	12.3	207.7
HAPS	8.77	-	-	8.77
CO_2e	577	5.68	308	891

Notes:
(1) For some streams, a portion of the material was only defined as hydrocarbons. For these cases, the total amount of hydrocarbon leaks from the process were used to calculate both total VOC emissions and total GHG emissions (from methane).

3.4.3 *Low Pressure Flare Emissions*

The emissions generated by the low pressure flare pilots, associated with Plant B, were estimated based on emission factors derived from AP-42 Chapter 1.4 for natural gas combustion. The flare pilots are assumed to operate 8,760 hr/yr.

3.4.4 *Polyethylene Plant Material Handling Operations*

The operation of the PE plants requires the transfer of solid materials. Material handling operations of solids generate PM emissions. The material handling emissions from these processes will be controlled by baghouses and/or fabric filters with a 0.01 gr/scf control. The primary areas of material handling include additive transfer and extrusion/pelleting operations. Plant A has a potential of 10.6 tpy PM emissions. The material handling emissions from the other PE plants are less than one tpy.

3.5 *SUPPORT UTILITIES EMISSIONS*

The emission sources associated the support utility operations are presented in Table 3-12. The following section describes the estimated potential emissions for each source and the methodology used to calculate all emissions. The support utilities include the combustion turbine, auxiliary boilers, cooling tower, emergency generators, and emergency fire water pump engines.

Table 3 -12 Support Utility Emission Sources

Emission Unit	**Source Description**	**Emission Type**	**Size/Capacity**	**Fuel(s)**	**Proposed Maximum Operations**
SU-GT-101	GE 7EA Gas Turbine	Criteria, GHG, and HAPS	942.6 MMBtu/hr	NG	8,760 hr/yr

Emission Unit	Source Description	Emission Type	Size/Capacity	Fuel(s)	Proposed Maximum Operations
SU-GT-102	HRSG Duct Burner	Criteria, GHG, and HAPS	350 MMBtu/hr	NG	8,760 hr/yr
SU-AB-101	Auxiliary Boiler #1	Criteria, GHG, and HAPS	206 MMBtu/hr	NG	8,760 hr/yr
SU-AB-102	Auxiliary Boiler #2	Criteria, GHG, and HAPS	206 MMBtu/hr	NG	8,760 hr/yr
SU-CT-101	Cooling Tower	PM and VOC	366,801 gpm	N/A	8,760 hr/yr
SU-EG-101	Emergency Generator - Cracker Plant	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG -102	Emergency Generator – Plant A	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG-103	Emergency Generator – Plant C	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG-104	Emergency Generator – Plant B	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG-105	Emergency Generator - Utility #1	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG-106	Emergency Generator - Utility #2	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG-107	Emergency Generator - WWTP	Criteria, GHG, and HAPS	2800 kW	ULSD	100 hr/yr
SU-EG-108	Emergency Generator - Cooling Water	Criteria, GHG, and HAPS	350 kW	ULSD	100 hr/yr
EU-EG-109	Emergency Generator - Product Storage	Criteria, GHG, and HAPS	350 kW	ULSD	100 hr/yr
SU-FP-101	Fire Water Pump #1	Criteria, GHG, and HAPS	485 kW	ULSD	100 hr/yr
SU-FP-102	Fire Water Pump #2	Criteria, GHG, and HAPS	485 kW	ULSD	100 hr/yr
SU-FP-103	Fire Water Pump #3	Criteria, GHG, and HAPS	485 kW	ULSD	100 hr/yr

3.5.1 *Combustion Turbine and HRSG Duct Burner*

The combustion turbine will consist of one on GE 7EA natural gas combustion GT, rated at 942.6 MMBtu/hr and one HRSG natural gas duct burner, rated at 346 MMBtu/hr. Both the combustion turbine and the duct burner will be equipped with Low NO_x Burners and a Selective Catalytic Reduction (SCR) system, at an 80% NO_x control efficiency, to control all NO_x emissions. Additionally, an oxidation catalyst, will be constructed to control CO and VOC emissions. The oxidation catalyst will be designed with an 80% CO control efficiency.

The potential emissions for NO_x, CO, and VOC pollutants are based on vendor provided emissions factors. The vendor emission factors for NO_x, CO, and VOC were established by selecting the maximum lb/hr emission rates across potential operating load and ambient temperature ranges. The lb/hr values provided by the vendor accounted for the NOx and CO 80% control efficiencies. This ensures that potential emission estimates represent a conservative estimate across all operating scenarios. All other pollutants were estimated based on USEPA's AP-42 Chapters 3.1 (for the combustion turbine) and 1.4 (for the HRSG) or more stringent BACT determinations, where applicable.

Where vendor data was provided, potential annual emissions were calculated by multiplying the maximum short-term emission rates by 8,760 hr/yr and then dividing by 2,000 to convert form pounds to tons. For pollutants that required the use of lb/MMBtu emissions factors (e.g., AP-42), the emissions factor was multiplied by the maximum design capacity (MMBtu/hr) of the unit with an assumed schedule of 8,760 hr/yr. There are no planned shut downs of the combustion GT.

3.5.2 *Auxiliary Boilers*

The project will include the use of two auxiliary boilers each rated at 206 MMBtu/hr. Potential emissions for the auxiliary boilers were calculated based on AP-42 Chapter 1.4 emission factors. No vendor data is available for the boilers at this time. The two auxiliary boilers will be equipped with ULNBs. The maximum operating schedule for the two boilers is assumed to be 8,760 hr/yr.

3.5.3 *Emergency Generators and Fire Water Pump Engines*

The vendor for the proposed emergency generators and fire water pump engines have not yet been selected. Emission rates for NO_x, PM, and CO were estimated based on emission factors derived from 40 CFR 60, Subpart IIII. All other emission factors used in emission calculations were estimated based on AP-42 Chapters 3.3 and 3.4 for diesel fired internal combustion engines. Per 40 CFR Part 60, Subpart IIII, the total hours for maintenance and readiness testing will not exceed 100 hr/yr. There is no limit on runtime of the emergency engines during periods of emergency, however these events are not considered part of normal operation. As such, the potential emission for the emergency generators and fire water pump engines were calculated based on 100 hr/yr of operation.

3.5.4 *Cooling Tower*

Potential emissions from the proposed Cooling Tower are limited to PM and VOC emissions.

For potential emissions purposes, the VOC emissions associated with the Cooling Tower are based on hydrocarbon equipment leaks from the ethane cracker process that may come in contact with cooling water. VOC emissions were calculated based on AP-42 Chapter 5 Section 1 emission factors. Based on the emissions factors used, assumptions provided, and a continuous operating schedule, the Project will emit a potential of 67.5 tpy of VOC emissions from the cooling tower.

The PM drift emissions from the Cooling Tower are limited to the particulate associated with dissolved solids in liquid droplets that become entrained in the air stream exiting the Cooling Tower. PM emission estimates from the proposed Cooling Tower are based on the industry guidance document: GE Power and Water Handbook, Chapter 31 Open Recirculating Cooling Systems. A number of operating specifications are needed to determine the potential PM emissions from the Cooling Tower. A water circulation rate of 366,803 gallons per minute (gpm) and a maximum of five (5) cycles of concentration in the circulating water were provided by the vendor. The Cooling Tower will be equipped with Drift Elimination with a drift rate of at least 0.0005%. Finally, the maximum total dissolved solids (TDS) content in the make-up of the cooling water was estimated at 250 mg/L based on West Virginia water quality data. Potential PM, PM10, and PM2.5 emissions from the Cooling Tower were estimated at 5.02, 4.64, and 0.21 tpy, respectively.

3.5.5 Wastewater Treatment Plant

Potential emissions generated from the WWTP operations are limited to VOC and HAP emissions. Emissions were estimated using the USEPA's modeling software package WATER9 Version 3.0.

The VOC and HAP emission are primarily generated from the CPI, DAF, and MBR units. These units use aeration to aid in water treatment, which increases the amount of volatile compounds emitted to the atmosphere. The wastewater treatment plant must meet the requirement of Ethylene MACT (40 CFR Part 63 Subpart XX). Therefore, to control benzene it is assumed that the systems will be equipped with covers including at the CPI and DAF emissions point, consistent with regulations for benzene waste operations. These results are based on unit sizes from a WWTP with similar flow rates and treatment units. Additionally, influent concentrations for the wastewater streams are estimated based on similar facilities. The total VOC and total HAP emissions from Project ASCENT were both estimated to be 1.69 tpy.

3.5.6 Storage Tanks

Project ASCENT will include the installation of numerous storage vessels for volatile organic liquids, water, or inorganic liquids, as well as pressurized storage vessels. Pressurized vessels (e.g., ethane, isobutene, etc.) were assumed to not be sources of emissions. Similarly, storage vessels containing water and inorganic materials are not sources of VOCs or HAPs. The potential emissions from the remaining storage tanks were estimated using USEPA's TANKS 4.09D software.

Tank contents and sizes are preliminary designs provided by the vendor where available. Although vendors for the emergency engines are not yet determined, tank sizes for the diesel generator tanks were estimated based on specification sheets available online for similar size engines.

Best available Material safety data sheets (MSDS) were utilized to populate mixtures if necessary. Spent caustic from the ethane cracker plant operations will contain organics. The spent caustic speciation was assumed to be the same as the pyrolysis gas tanks.

VOC and total HAP emissions from storage tanks are provided in Table 3-13.

Table 3-13 Storage Tanks Potential Emissions

Equipment Information		Controlled Potential Emissions (tpy)	
Tank No.	**Contents**	**Total VOC Losses**	**Total HAP Losses**
10-TK-1002A	Pygas storage tank	0.323	1.43E-01
10-TK-1002B	Pygas storage tank	0.323	1.43E-01
10-TK-1032	Hexene-1 storage tank	1.04	-
10-TK-1033	Inert hydrocarbon storage tank	0.206	-
10-TK-1050	Comonomer storage tank	0.251	2.51E-01
20-TK-2931	Spent caustic tank	0.659	2.91E-01
20-TK-2942	Wash oil storage	0.004	-
20-TK-2951	Thermal Oxidizer Feed tank	0.0002	-
EG-TK-101	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-102	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-103	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-104	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-105	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-106	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-107	Diesel fuel tank	5.77E-04	8.96E-05
EG-TK-108	Diesel fuel tank	8.80E-05	1.37E-05
EG-TK-109	Diesel fuel tank	8.80E-05	1.37E-05
FP-TK-101	Diesel fuel tank	1.64E-04	2.54E-05
FP-TK-102	Diesel fuel tank	1.64E-04	2.54E-05
FP-TK-103	Diesel fuel tank	1.64E-04	2.54E-05
	Total (tpy)	**2.81**	0.828

Note: For emissions calculation purposes, Tank No. 10-TK-1033 was assumed to be isopentane; other possible inert hydrocarbons at the facility include pentane, butene, and isobutane. The contents of Tank No. 10-TK-1050 were assumed to be vinyl acetate for emissions purposes; other possible comonomers include acrylic acid or methyl acrylate.

3.5.6 Loading Racks

The Project ASCENT facility will be equipped with two loading racks; one for the transfer of cold liquid storage and one for the transfer of ambient liquid storage. Each loading rack will be controlled by a flare and achieve a 98% control efficiency. To estimate emissions, the product throughputs to/from the loading rack were multiplied by a VOC efficiency of 10 mg/L. This value was derived from the New Jersey Department of Environmental Protection (NJDEP) State of the Art Manual which equivalents the 10 mg/L value to a an expected minimum performance of 98% destruction efficiency. The total VOC and HAP emissions associated with loading transfers are 9.57 tpy and 1.99 tpy, respectively.

4.0 PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

4.1 APPLICABILITY

If ambient air quality monitoring indicates that the concentration of a pollutant exceeds a National Ambient Air Quality Standard (NAAQS) in any area of the country, that area is classified as a "Non-Attainment area" for that pollutant, meaning that the area is not meeting the NAAQS. Conversely, any area in which the concentration of a criteria pollutant is below the NAAQS is classified an "attainment area" indicating that the NAAQS is being met.

PSD applicability is based on two factors. First, an emission source must be located in an area that is in attainment or unclassifiable for at least one NAAQS. When a location is in attainment or unclassifiable for a given pollutant, PSD then applies to any new major sources of those pollutants or any major modifications with respect to those pollutants. With PSD, if a source emits one or more pollutants in major amounts, the source is considered major. Then, all attainment pollutants (i.e., pollutants that have been designated as in attainment for the area) emitted, even those emitted in non-major amounts, must be reviewed for PSD applicability by comparing their potential annual emissions to the applicable Significant Emissions Rates (SERs). Emissions greater than or equal to the applicable SER subject the pollutant to PSD. The Parkersburg-Marietta, WV-OH area, which includes Wood County, is designated as attainment for all pollutants. Therefore, the potential annual emissions from all pollutants for the ASCENT Project were compared against the PSD major source thresholds.

The proposed Project emits more than one pollutant (e.g., NO_x) in major amounts. Therefore, emissions of all PSD-regulated pollutants must be compared to their respective SERs. As summarized in Table 4-1, potential emissions of NO_x, CO, PM, PM10, PM2.5, VOCs, and GHGs exceed their SERs and trigger PSD. For these pollutants, the owner must:

- Demonstrate use of BACT for pollutants with significant emissions (Section 4.2, Appendix E of the permit application);

- Assess the ambient impact of emissions using dispersion modeling; if the impact is significant, evaluate (through refined dispersion modeling) compliance with the NAAQS and consumption of air quality increments (The air quality dispersion modeling analysis is discussed briefly in Section 4.3, the modeling protocol is included as Appendix F of the permit application); and
- Conduct additional impact assessments that analyze impairment to visibility, soils, and vegetation as a result of the modification, as well as impacts on Class I areas (The air quality dispersion modeling analyses will be used to conduct these assessments).

Table 4-1 PSD Applicability Summary

Pollutant	Potential Project Emissions (tpy)	PSD Significant Emissions Rate (tpy)	Triggers PSD?
NO_X	692	40	Y
CO	301	100	Y
PM	140	25	Y
PM10	152	15	Y
PM2.5	147	10	Y
VOC	532	40	Y
Pb	0.011	0.6	N
SO_2	28.1	40	N
SAM	2.09	7	N
GHG (CO_2e)	2,311,914	100,000	Y

4.2 BEST AVAILABLE CONTROL TECHNOLOGY ANALYSIS

A Best Available Control Technology (BACT) analysis is required for projects triggering a significant emissions increase under the federal PSD regulations. Based on projected potential emissions, BACT is required for NO_x, CO, PM, PM10, PM2.5, VOCs, and GHG emissions from all Project emissions sources. The full Project ASCENT BACT Analysis and supporting tables is provided as Appendix E of the permit application. Table 4-2 provides a summary of the conclusions from the BACT analysis.

Table 4-2 BACT Analysis Summary

Equipment	Pollutant	Emission Rate	Unit	Control Method
Pyrolysis Furnaces Normal Operation	NOx	0.06	lb/MMbtu	ULNB
	CO	0.01	lb/MMbtu	Good combustion practices
	PM/PM10/PM2.5	0.009	lb/MMbtu	Use of gaseous fuels only
	VOC	0.003	lb/MMbtu	Use of gaseous fuels only, good combustion practices
	GHG			Furnace gas exhaust ≤ 310°F
Pyrolysis Furnaces Decoking Operation	NOx	0.06	lb/MMbtu	Same as normal operation
	CO	0.01	lb/MMbtu	Same as normal operation
	PM/PM10/PM2.5	0.218	lb/MMbtu	Decoke ≤ 12 times/year/furnace
	VOC	0.003	lb/MMbtu	Same as normal operation
	GHG			Decoke ≤ 12 times/year/furnace
Auxiliary Boilers	NOx	0.02	lb/MMbtu	ULNB
	CO	0.035	lb/MMbtu	Good combustion practices
	PM/PM10/PM2.5	0.002	lb/MMbtu	Good combustion practices and use of clean fuels
	VOC	0.0013	lb/MMbtu	Efficient Combustion
	GHG			Energy efficiency measures: use of economizers and boiler insulation; improved combustion measures (i.e., tuning, optimization, and instrumentation); and minimization of air infiltration.
GE 7EA Gas Turbine	NOx	2.0	ppmvd @ 15% O	SCR, dry low-NOX combustor design, and efficient combustion
	CO	2.0	ppmvd @ 15% O	Oxidation Catalysts and efficient combustion
	PM	0.005	lb/MMbtu	Good combustion practices and use of clean fuels
	VOC	1.0	ppmvd @ 15% O	Oxidation Catalysts and good combustion practices
	GHG	1,000	lb/MWh gross	Good combustion/operating practices and fueled by natural gas
GE 7EA Gas Turbine + HRSG	NOx	2.0	ppmvd @ 15% O	SCR, dry low-NOX combustor design, and efficient combustion
	CO	2.0	ppmvd @ 15% O	Oxidation Catalysts and efficient combustion
	PM/PM10/PM2.5	0.005	lb/MMbtu	Good combustion practices and use of clean fuels
	VOC	2.0	ppmvd @ 15% O	Oxidation Catalysts and good combustion practices
	GHG			Good combustion/operating practices and fueled by natural gas

Equipment	Pollutant	Emission Rate	Unit	Control Method
Thermal Oxidizers & RTO Burners	NOx	0.04	lb/MMbtu	LNB
	CO	0.04	lb/MMbtu	Optimized air-fuel ratio
	PM/PM10/PM2.5	0.0075	lb/MMbtu	Proper equipment design, good combustion practices, optimized fuel to air ratio
	VOC			Firing of gaseous fuels and good combustion practices.
	GHG			Maintain a minimum combustion temperature as determined by initial compliance testing.
Flare Pilot Burners	NOx	0.068	lb/MMbtu	1. Firing of Low Carbon Fuels 2. Flare Management Plan 3. Good Combustion Practices
	CO	0.4	lb/MMbtu	
	PM/PM10/PM2.5	0.019	lb/MMbtu	
	GHG			
Catalyst Activator	NOx	0.049	lb/MMbtu	Use of good combustion practices, LNB
	CO	0.082	lb/MMbtu	Good combustion practices
	PM/PM10/PM2.5	0.0075	lb/MMbtu	Use of pipeline-quality natural gas and good combustion practices
	VOC	0.0054	lb/MMbtu	Use of gaseous fuel (e.g. pipeline-quality natural gas)
	GHG			
Emergency Generators >750 HP	NMHC + NOx	4.80	g/hp-hr	40 CFR 60, Subpart IIII
	CO	2.60	g/hp-hr	40 CFR 60, Subpart IIII
	PM	0.15	g/hp-hr	40 CFR 60, Subpart IIII
	PM10/PM2.5	0.17	g/hp-hr	40 CFR 60, Subpart IIII; EPA AP-42
	GHG			
Firewater Pumps 600 ≤ HP ≤ 750 HP	NMHC + NOx	3.00	g/hp-hr	40 CFR 60, Subpart IIII
	CO	2.60	g/hp-hr	40 CFR 60, Subpart IIII
	PM	0.15	g/hp-hr	40 CFR 60, Subpart IIII
	PM10/PM2.5	0.17	g/hp-hr	40 CFR 60, Subpart IIII; EPA AP-42
	GHG			
Emergency Generators 300 ≤ HP < 600 HP	NMHC + NOx	3.00	g/hp-hr	40 CFR 60, Subpart IIII
	CO	2.60	g/hp-hr	40 CFR 60, Subpart IIII
	PM	0.15	g/hp-hr	40 CFR 60, Subpart IIII
	PM10/PM2.5	0.17	g/hp-hr	40 CFR 60, Subpart IIII; EPA AP-42
	GHG			
Ethane Cracker – Process Vent Streams to Thermal Oxidizer	VOC	99.9	% destruction	Routed to control device

Equipment	Pollutant	Emission Rate	Unit	Control Method
PE Plant Process Vent Streams to Flares	VOC	98.0	% destruction	Routed to control device
LPDE Plant Process Vent Streams to RTO	VOC	99.0	% destruction	Routed to control device
Cooling Tower	PM	0.0005	% Drift	High-efficiency drift eliminators
	VOC	Use of Leak Detection and Repair Program		
Tanks	VOC	Subpart Kb as applicable		
Material Handling	PM	0.01	gr/scf @ exhaust	Dust collectors as needed and best management practices
Loading/Unloading Operations	VOC	Collection System and 98% destruction treatment for handling of streams with vapor pressure > 0.5 psia for loading/unloading operations		
Fugitive Leaks	VOC	LDAR for VOC services (NSPS VVa)		
	GHG	LDAR and AVO inspections for GHG sources not in VOC service		

4.3 NAAQS DISPERSION MODELING ANALYSIS

The PSD regulations require additional analyses beyond BACT assessments including:

- An assessment of compliance with NAAQS and PSD increments;
- An evaluation of whether the Project results in any impairment to visibility, soils, and vegetation that would occur as a result of the new source, and of general commercial, residential, industrial, and other growth associated with the new source. Furthermore, impacts on Class I areas must be analyzed to determine compliance with Class I increments and to assess the impacts of new emissions on air quality related values (AQRVs); and
- An evaluation of the Project's impacts on PSD Class I Areas.

The most current version of the Project Ascent Air Quality Modeling Protocol is included as Appendix F of the permit application. Upon approval of the protocol by WVDEP, ASCENT will complete the analyses above including the NAAQS and PSD increment compliance demonstrations. The modeling analyses will be submitted to WVDEP under separate cover.

5.0 NON-ATTAINMENT NEW SOURCE REVIEW (NA-NSR)

The Parkersburg-Marietta, WV-OH area, which includes Wood County and the Grant Tax District in Pleasants County, is in attainment for all criteria pollutants. As there are no areas in Wood County with the air quality designated as non-attainment, a non-attainment new source review is not required for this Project.

6.0 *APPLICABLE REQUIREMENTS REVIEW*

This section briefly outlines the significant federal and State air quality requirements to which the proposed ASCENT Project will be subject, in addition to the PSD and NA-NSR requirements presented previously.

6.1 *FEDERAL REQUIREMENTS*

6.1.1 *New Source Performance Standards (NSPS)*

6.1.1.1 *Steam Generating Units (Subpart Db)*

The natural gas fired auxiliary boilers are subject to 40 CFR 60, Subpart Db, "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units." The affected facility includes all steam generating units constructed, modified, or reconstructed after June 19, 1984 and that have a heat input capacity greater than 29 megawatts (MW) (100 MMBtu/hr). Note that affected facilities regulated under Subpart Db are exempt from the requirements of Subpart D.

The Subpart Db emission limits are:

- SO_2
  - 0.20 lb/MMBtu; or
  - 92 percent reduction of the potential SO_2 emission rate and 1.2 lb/MMBtu;
- PM – Does not apply to natural gas-fired units;
- NO_x
  - Low heat release rate (70,000 Btu/hr-ft^3 or less) – 0.10 lb/MMBtu; and
  - High heat release rate (greater than 70,000 Btu/hr-ft^3) – 0.20 lb/MMBtu.

Subpart Db includes general compliance requirements (60.45b & 40.56b), emissions monitoring requirements (60.47b & 60.48b), and reporting requirements (60.49b). The ASCENT Project will also be subject to applicable notification, monitoring and reporting and related applicable provisions of 40 CFR 60.7 and 60.8.

6.1.1.2 *Volatile Organic Liquid Storage Vessels (Subpart Kb)*

The affected facility subject to 40 CFR 60 Subpart Kb, "Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) For Which Construction, Reconstruction, or Modification Commenced After July 23, 1984" is storage vessels containing volatile organic liquids with a capacity greater than or equal to 75 m^3. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa), or storage vessels with a capacity greater than or equal to 75 m^3, but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa. All subject storage tanks are required to be equipped with a fixed roof in combination with an internal floating roof, an external floating roof, or a closed vent system and control device. The storage tanks for the ASCENT Project will use a closed vent system and control device to meet the requirements of 40 CFR 63, Subpart Kb. The facility will be subject to the monitoring, testing, recordkeeping, and reporting requirements in 60.113b-116b.

6.1.1.3 *Polymer Manufacturing Industry (Subpart DDD)*

The affected facilities that are subject to 40 CFR 60, Subpart DDD, "Standards of Performance for VOC Emissions from the Polymer Manufacturing Industry" are polyethylene equipment, from raw material preparation to product storage, which are constructed, modified, or reconstructed after January 10, 1989. Note that affected facilities regulated under Subpart DDD are exempt from the requirements of 40 CFR 60, Subpart III, NNN, and RRR.

Subpart DDD includes emissions standards for affected polyethylene manufacturing facilities in 60.562-1(a). Continuous standard process emission streams will be controlled in accordance with 60.562-1(a)(1)(i)(D) by venting to a control device located on the Project site. Intermittent emissions will be controlled in accordance with 60.562-2(i)A-C by combusting the emissions in a flare designed to maintain a stable flame, operate with a flame at all times, and operate with no visible emissions, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

Subpart DDD affected facilities are subject to the rules set forth in 40 CFR 60, Subpart VVa, "Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006". Polyethylene manufacturing plants are required to implement a Leak Detection and Repair (LDAR) program that complies with the equipment leaks of VOC requirement set forth in Subpart VVa (60.482-1-60.482-10).

Subpart DDD also includes monitoring (60.563), testing (60.564), and reporting and recordkeeping (60.565) requirements.

6.1.1.4 Commercial and Industrial Solid Waste Incinerator (Subpart CCCC)

An emission source is subject to the proposed CISWI Rule if it would combust solid or liquid materials defined to be commercial or industrial solid waste under the proposed EPA Solid Waste Identification Rule. There is no de minimis threshold for applicability based on a minimum facility size or processing rate. However, under the proposed Solid Waste Identification Rule, if a material is determined not to be a solid waste material, it is then classified as being either a "fuel" or a process "ingredient" when combusted. For such non-waste "fuels" or "ingredients," combustion of the material would not be regulated under the CISWI Rule.

Project ASCENT will not be subject to the CISWI rule. ASCENT is coordinating with the design technology vendors to ensure that streams to control equipment (e.g., thermal oxidizers) meet the requirements for non-regulated materials.

6.1.1.5 Compression Ignition Internal Combustion Engines (Subpart IIII)

The emergency generators and fire water pumps are subject to 40 CFR 60, Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" and the associated fuel, monitoring, compliance, testing, notification, reporting, and recordkeeping requirements (40 CFR 60.4200 *et seq*.) and related applicable provisions of 40 CFR 60.7 and 60.8. The emissions standards in Subpart IIII for the emergency generators and fire water pumps are summarized in Table 6-1 below.

Table 6-1 Emission Standards for Emergency Engines (g/hp-hr)

Emergency Engine	$NMHC+NO_X$	CO	PM
485-kW Fire Water Pumps 448<kW<560 (600<hp<750)	3.0	2.6	0.15
350-kW Emergency Generators 224<kW<448 (300<hp<600)	3.0	2.6	0.15
2,800-kW Emergency Generators >600 kW (>750 hp)	4.8	2.6	0.15

6.1.1.6 Combustion Turbines (Subpart KKKK)

The natural gas fired stationary combustion GT at the ASCENT Project is subject to 40 CFR 60, Subpart KKKK, "Standards of Performance for Stationary Combustion Turbines". All stationary gas turbines with a heat input at a peak load equal to or greater than 10.7 gigajoules per hour (10 MMBtu/hr), based on the higher heating value of the fuel, which commenced construction, modification, or reconstruction after February 18, 2005 are subject to this NSPS Subpart KKKK. Note that stationary GTs regulated under Subpart KKKK are exempt from the requirements of Subpart GG.

The Subpart KKKK emission limits are:

- NO_x
  - o 15 ppm at 15 percent O_2; or
  - o 0.43 lb/MWh; and
- SO_2 – 0.90 lb/MWh.

Subpart KKKK includes general compliance requirements (60.4333), monitoring requirements (60.4335-60.4370), reporting requirements

(60.4375-60.4395), and performance testing (60.4400-60.4415). The affected facilities will also be subject to applicable notification, monitoring and reporting and related applicable provisions of 40 CFR 60.7 and 60.8.

6.1.1.7 NSPS for GHGs

On September 20, 2013, USEPA proposed a revised Carbon Pollution Standard that would set national limits on the amount of GHGs emissions allowed for new power plants. The rule will be promulgated under authority of Section 111 of the Clean Air Act (i.e., NSPS), and applies to new electric utility generating units (EGUs).

USEPA is proposing to codify the CO_2 standards of performance in the same subparts – Da and KKKK, depending on the types of units – that currently include the standards of performance for conventional pollutants. However, USEPA is co-proposing an alternative to codify the CO_2 standards in a new Subpart, TTTT, as in USEPA's original April 2012 proposal.

This new proposal was issued after USEPA received and reviewed more than 2.5 million public comments on the April 2012 Carbon Pollution Standard. Concurrent with this proposal, USEPA is rescinding the original April 2012 proposed rule.

In a change from the April 2012 proposal, USEPA is now proposing a standard of performance for natural gas-fired stationary combustion turbines and for fossil fuel-fired utility boilers and integrated gasification combined-cycle (IGCC) units called the Best System of Emission Reduction (BSER). This is the most controversial part of the rule.

For affected gas turbine EGUs, the proposed limits are based on the performance of a combined-cycle design with two (1) size categories. Larger units with a heat input rating greater than 850 MMBtu/hr will be required to meet a standard of 1,000 pounds of CO_2 per gross megawatt-hour (lb-CO_2/MWh gross). Units rated less than 850 MMBtu/hr will be subject to a standard of 1,100 lb-CO_2/MWh gross. USEPA states that it considers modern and efficient natural-gas combined-cycle (NGCC) as BSER for new affected combustion turbines (Subpart KKKK sources). USEPA decided that CCS could not be considered as BSER for gas-fired GTs due to: 1) the significantly lower concentration of CO_2 in the flue gas; 2) there is only one (1) CCS demonstration project on a NGCC facility; and 3) the potential of significant impacts to electricity prices and reliability of the imposition of CCS on few coal fired units.

This rulemaking will continue to be monitored and, upon its promulgation, will be evaluated to determine applicability to the Project.

6.1.2 National Emission Standard for Hazardous Air Pollutants (NESHAP)

National Emissions Standards for Hazardous Air Pollutants (NESHAPs) are federal HAP requirements in 40 CFR 63 that apply generally to "major" sources of HAPs, defined as facilities with the potential to emit 10 tpy or more of any single HAP or 25 tpy or more of all HAPs. HAP standards, known as Maximum Achievable Control Technology (MACT) standards, for major HAP sources are established for classes or categories of sources.

The total potential HAP emissions for the facility are projected to be more than 25 tpy for all HAPs combined. Therefore, the Project is considered a major HAP source and source-specific MACT standards apply.

6.1.2.1 Industrial Process Cooling Towers (Subpart Q)

The quench tower for the ASCENT Project is not subject to 40 CFR 63, Subpart Q, “National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers”, since it is not operated with chromium-based water treatment chemicals.

6.1.2.2 Equipment Leaks – Control Level 2 Standards (Subpart UU)

The provisions of 40 CFR 63, Subpart UU, “National Emission Standard for Equipment Leaks – Control Level 2 Standards”, apply to the control of air emissions from equipment leaks for which another subpart references the use of this subpart for such air emission control. The equipment leaks associated with the Project are subject to Subpart UU as referenced by 63.1103(e) (Subpart YY).

Equipment that contains or contacts regulated HAPs, including pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, instrumentation systems, closed vent systems, and control devices is subject. Subject equipment will be identified and monitored using an instrument reading that defines a leak based upon the standards of the component outlined in 63.1025-1034. The facility will also be subject to the recordkeeping and reporting requirements of 63.1038-1039 for applicable components.

6.1.2.3 *Ethylene Manufacturing Process Units: Heat Exchange Systems and Waste Operation (Subpart XX)*

A heat exchange system is subject to 40 CFR 63, Subpart XX, "National Emission Standards for Ethylene Manufacturing Process Units: Heat Exchange Systems and Waste Operations" if regulations for ethylene production units in Subpart YY require a facility to comply with Subpart XX. Heat exchange systems at the site are subject to the MACT standards outlined in Subpart YY of general monitoring, recordkeeping, and the reporting requirements of 40 CFR 63.1084-63.1090. Project ASCENT does not include any heat exchange systems operated within the polyethylene units that are subject to this regulation.

Waste operations that have waste streams containing butadiene or benzene at the facility are subject to this subpart. Continuous butadiene waste streams that contain greater than or equal to 10 ppm_w 1,3-butadiene and have a flow rate greater than or equal to 0.02 liter per minute have the following applicable MACT standards:

- The continuous butadiene stream must be routed to a treatment process or wastewater treatment system that complies with 40 CFR 61.348;
- Receiving waste management units must comply with applicable MACT standards;
- Recordkeeping requirements of 40 CFR 61.356b; and
- Reporting requirements of 40 CFR 61.357a.

Waste streams that contain benzene must be either treated at the facility according to 40 CFR 61.342(c)(1)-(3) or transported off site in accordance with 40 CFR 63.1096. There will not be any waste streams that contain benzene within the polyethylene units for the Project.

6.1.2.4 *Generic MACT Standards (Subpart YY)*

The ASCENT Project is subject to 40 CFR 63, Subpart YY "National Emissions Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards" as ethylene production is a source categories listed in 63.1110. The applicable MACT standards for ethylene process vents, transfer racks, equipment containing or contacting HAPs, processes that generate waste, and heat exchange systems are as follows:

- Ethylene process vents – Reduce HAP emissions by 98% or to a TOC concentration of 20 ppm_v;
- Transfer racks – Reduce HAP emissions by 98% or to a TOC concentration of 20 ppm_v or install process piping to capture HAP-containing vapors during loading activities;
- Equipment containing or contacting HAPs – Comply with 40 CFR 63, Subpart UU;
- Processes that generate waste – Comply with 40 CFR 63, Subpart XX; and
- Heat exchange systems – Comply with 40 CFR 63, Subpart XX.

6.1.2.5 *Stationary Combustion Turbines (Subpart YYYY)*

The affected units subject to 40 CFR 63, Subpart YYYY, "National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines", are stationary CTs located a major source of HAP emissions that are constructed or reconstructed after January 14, 2003. The ASCENT Project equipment is subject to the provisions of this subpart including a 91 ppb_v or less at 15 percent oxygen formaldehyde emission limit for the gas-fired CT.

6.1.2.6 *Stationary Reciprocating Internal Combustion Engines (Subpart ZZZZ)*

All of the emergency generators and fire water pumps are subject to 40 CFR 63, Subpart ZZZZ "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines" and its associated fuel, monitoring, compliance, testing, notification, reporting, and recordkeeping requirements. However as per 63.6590(c)(7), the 350 kW emergency generators (SU-EG-108 & SU-EG-109) are required to meet the requirements of this subpart by complying for the requirements of 40 CFR 60, Subpart IIII as they are new emergency stationary RICE rated at less than 500 hp that are located at a major source of HAP emissions. In addition, the emergency equipment rated at greater than 500 hp is subject to limited requirements as per 63.6590(b)(1)(i). These limited requirements include monitoring requirements in 63.6605(b) and 63.6640(f) and notification requirements in 63.6645(f).

6.1.2.7 *Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (Subpart DDDDD)*

Since the Project will be a major source of HAPs, the auxiliary boilers are subject to 40 CFR 63, Subpart DDDDD, "National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, And Institutional Boilers and Process Heaters". This subpart applies to new or reconstructed industrial, commercial, and institutional boilers and process heaters where construction commenced after June 4, 2010. There are no emission limits in this regulation for new or reconstructed natural gas-fired boilers or process heaters; however, emission limitations are regulated under 40 CFR 60 Subpart Db, "Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units" (See Section 6.1.1.1). The auxiliary boilers are subject to the testing, analysis, initial compliance, notification, reporting, and recordkeeping requirements 63.7505-63.7575.

6.1.3 ***Acid Rain Program***

The proposed combustion turbine meets the definition of an "affected unit" as defined in 40 CFR 72.6, and are therefore subject to the requirements of the Acid Rain Program, including emissions standards (40 CFR 72.9) and monitoring requirements (40 Part 75), among other requirements. In addition, the Project owner is required to apply for, and obtain, an Acid Rain permit, pursuant to 40 CFR 72.30. The terms of the Acid Rain permit will be incorporated into the facility's Title V operating permit when it is issued by WVDEP in the future. Pursuant to 40 CFR 72.30(b)(2)(ii), the Acid Rain permit application must be submitted to the permitting authority at least 24 months before the date on which a unit commences operation. With commencement of operation expected in the second quarter of 2018, the Acid Rain permit application must be submitted by the second quarter of 2016.

6.2 STATE REQUIREMENTS

The proposed Project will be subject to a number of WVDEP air quality requirements including, but not limited to, the following:

6.2.1 To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers (45 CSR 02)

The auxiliary boilers are natural gas-fired indirect heat exchangers with design heat input capacities greater than 10 MMBtu/hr. The auxiliary boilers will comply with the applicable particulate matter emission limits and visible emission standards in the rule.

6.2.2 To Prevent and Control the Discharge of Air Pollutants into Open Air which Causes or Contributes to an Objectionable Odor or Odors (45 CSR 04)

Materials used and manufactured do not have low odor thresholds. Emissions from the facility will be controlled by various air pollution control devices that should further minimize potential objectionable odors.

6.2.3 To Prevent and Control Air Pollution from Combustion of Reuse (45 CSR 06)

Thermal oxidizers and flares are designed and operated to comply with the allowable particulate matter and opacity limitations.

6.2.4 *To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associated Operations (45 CSR 07)*

Particulate matter emissions from manufacturing processes, associated operations, and fugitive sources will be designed and controlled to comply with the allowable particular matter emissions limitations, opacity standards, and minimization of fugitive emissions.

6.2.5 *To Prevent and Control Air Pollution from the Emission of Sulfur Oxides (45 CSR 10)*

The auxiliary boilers are natural gas-fired indirect heat exchangers with a design heat input capacity greater than 10 MMBtu/hr and the pyrolysis furnaces are fuel burning units having a design input of greater than 10 MMBtu/hr. These units will comply with the applicable sulfur dioxide emission limits in the rule.

6.2.6 *Prevention of Air Pollution Emergency Episodes (45 CSR 11)*

When requested by the WVDEP Director, standby plans for reducing air pollutant emissions during Air Pollution Alerts, Air Pollution Warnings, and Air Pollution Emergencies will be prepared.

6.2.7 *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, Permission to Commence Construction, and Procedures for Evaluation (45 CSR 13)*

This permit application is being submitted pursuant to 45 CSR 13 for the construction of the proposed Project.

6.2.8 *Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration (45 CSR 14)*

As described in Section 4.1, the proposed Project will be subject to PSD for NO_x, CO, PM, PM_{10}, $PM_{2.5}$, VOC, and GHGs.

6.2.9 *Standards of Performance for New Stationary Sources (45 CSR 16)*

As further detailed in Section 6.1.1, the proposed Project is subject to NSPS Subparts Db, Kb, DDD, IIII, and KKKK.

6.2.10 *Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution Which Cause or Contribute to Non-Attainment (45 CSR 19)*

The proposed Project is not located in a designated Non-Attainment area and will not trigger non-attainment NSR.

6.2.11 *Good Engineering Practice as Applicable to Stack Heights (45 CSR 20)*

Stack heights are designed to comply with good engineering practices specified by this regulation.

6.2.12 *Regulation to Prevent and Control Air Pollution from the Emissions of VOCs (45 CSR 21)*

The proposed Project will be located in Wood County, West Virginia, which is one of the counties subject to this regulation. Source specific sections potentially applicable to this project include §45-21-37 (Leaks from Synthetic Organic Chemical, Polymer, and Resin Manufacturing Equipment), §45-21-38 (Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins), and §45-21-40 (Other Facilities that Emit Volatile Organic Compound (VOC). The Project will comply with these sections' requirements, as well as other applicable testing and continuous emissions sections, by complying with the NSPS and NESHAP requirements as outlined in Sections 6.1.1 and 6.1.2, respectively.

6.2.13 *To Prevent and Control the Emissions of Toxic Air Pollutants (45 CSR 27)*

Regulated Toxic Air Pollutants (TAP) are also defined as Hazardous Air Pollutants (HAP). Air pollutant controls are installed and operated to meet the National Emission Standards for Hazardous Air Pollutants will also comply with this Rule's applicable requirements.

6.2.14 *Requirements for Operating Permits (45 CSR 30)*

The proposed Project will require a Title V Operating Permit. Pursuant to 45 CSR 30-4.1.a.2., the Project owners must file a complete application to obtain the Title V operating permit within 12 months after the Project commences operation, which is expected to occur in 2018.

6.2.15 *Acid Rain Provisions and Permits (45 CSR 33)*

The proposed GT will be subject to certain provisions of the acid Rain program, including the permitting provisions.

6.2.16 *Emission Standards for Hazardous Air Pollutants (45 CSR 34)*

As further detailed in Section 6.1.2, the proposed Project is subject to NESHAP Q, UU, XX, YY, YYYY, ZZZZ, and DDDDD.

7.0 CONCLUSIONS

Emissions from the proposed Project trigger PSD requirements for NO_x, CO, PM, PM10, PM2.5, VOC, and GHG. No pollutants trigger NA-NSR. Emissions of all other regulated pollutants, including HAPs, will be below regulatory thresholds.

Because emissions of NO_x, CO, PM, PM10, PM2.5, VOC, and GHG trigger PSD, Project ASCENT is required to meet BACT for these pollutants, and conduct impact assessments to ensure that emissions will not adversely affect ambient air quality.

Emissions from the proposed Project are not predicted to cause any significant adverse impacts to air quality. Specifically, emissions from the proposed Project will not adversely affect ambient air quality or PSD increments. The Project's impacts on visibility in the surrounding Class I areas are likely to be minimal.

In conclusion, an evaluation of the Project and its potential emissions indicates that Project ASCENT will meet all applicable State and federal air quality requirements.