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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2896C
Plant ID No.:	051-00142
Applicant:	Blue Racer Midstream, LLC (Blue Racer)
Facility Name:	Natrium Extraction and Fractionation Plant
Location:	Near Proctor, Marshall County
NAISC/SIC Code:	211112/1321
Application Type:	Modification
Received Date:	August 4, 2014
Engineer Assigned:	Joe R. Kessler
Fee Amount:	$2,000
Date Received:	August 8, 2014
Complete Date:	September 3, 2014
Due Date:	December 2, 2014
Applicant Ad Date:	August 15, 2014
Newspaper:	*Moundsville Daily Echo*
UTM's:	Easting: 512.1 km Northing: 4,400.8 km Zone: 17
Latitude/Longitude:	39.75996/-80.86101
Description:	Removal of annual fuel usage limit on the 216.7 mmBtu/hr Hot Oil Heater (S001) and addition of the following: four (4) new 61.6 mmBtu/hr heaters, a second fractionation train consisting of two (2) de-ethanizer towers, an ethane amine treating unit, a depropanizer, and a debutanizer, and increasing various facility storage capacities.

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On December 19, 2011 Dominion Natrium, LLC (Dominion) was issued Permit Number R13-2896 for the construction of the 400 mmscf-natural gas/day Natrium Extraction and Fractionation Plant. The facility began operation on May 15, 2013. Since that time, the facility has been the subject of both permitting and compliance/enforcement actions. The following summarizes these actions:

- On June 10, 2013, permit application R13-2896A was submitted for the installation of two (2) heaters and a Vapor Recovery Unit (VRU). However, this application was withdrawn on July 23, 2013 due to its submission by Blue Racer Natrium, LLC, who had not previously transferred the permit into their name;

- On July 31, 2013, Dominion agreed to a Consent Order (CO-R13-E-2013-12) concerning (primarily) the operation of a flare. As part of the Orders for Compliance, Dominion was required to submit a permit application to "correct all deficiencies and violations with Permit R13-2896;"

- On September 24, 2013, Permit Number R13-2896 was transferred to "Blue Racer Natrium, LLC;"

- On December 26, 2013, Permit Number R13-2896B was issued to Blue Racer Natrium, LLC to replace the existing flare and make other changes pursuant to requirements of the Consent Order. Additionally, and unrelated to the Consent Order, the permit authorized installation of two (2) process heaters; and

- On February 21, 2014 the permit was transferred to "Blue Racer Midstream, LLC." Formed in December 2012, Blue Racer Midstream is a joint venture between Caiman Energy II, LLC and Dominion; and

- On February 26, 2014 Blue Racer Midstream, LLC submitted permit application R14-0031 to relax the Greenhouse Gases (GHGs) synthetic minor limits that were part of R13-2896. This required Blue Racer to undergo Prevention of Significant Deterioration (PSD) review under 45CSR14 for the requested changes. However, on June 23, 2014, in *Utility Air Regulatory Group v. Environmental Protection Agency*, the Supreme Court (SCOTUS) ruled that GHGs alone could no longer define a source as a "major stationary source" or a modification as a "major modification" for the purposes of PSD review. Therefore, consistence with EPA guidance and with the concurrence of the DAQ, on August 7, 2014, Blue Racer withdrew permit application R14-0031 and resubmitted a request for the changes under permit application R13-2896C as a minor modification.

DESCRIPTION OF PROCESS/MODIFICATIONS

Existing Facility

The Natrium Extraction and Fractionation Processing Plant is an existing 400 million standard cubic feet per day (mmscfd) natural gas processing plant with natural gas liquids (NGL) processing capability located approximately four (4) miles northwest of Proctor, Marshall County, WV. The facility has the capability to both process large amounts of raw natural gas (by separating out the liquids, drying it, and removing impurities) and to fractionate NGLs into usable components. NGLs are generally defined to be the lighter liquid components entrained in the gas stream as opposed to "condensate" which is the heavier (and with a higher boiling point) organic compounds that are easily separated at the well-head and usually sent to a refinery. NGLs - both after separation from gas pipelined to the site, as well as NGLs sent to the site via pipeline, truck, railcar, or barge - are separated (or "fractionated") into their constituent organic compounds. The compounds ethane, propane, butane, i-butane, and natural gasoline are produced by the fractionation process.

Proposed Modifications

Blue Racer is proposing to make the following substantive modifications at the Natrium facility:

- Increasing the plant processing capacity from 400 mmscfd to 460 mmscfd of natural gas;
- Removal of annual fuel usage limit on the 216.7 mmBtu/hr Hot Oil Heater so as to allow the unit to operate at a 100% capacity factor;
- Addition of a second glycol dehydration unit with a 3.0 mmBtu/hr glycol reboiler into the second cryogenic train;
- Addition of a second 9.7 mmBtu/hr regenerator gas heater;
- Installation of a second NGL fractionation line that will include two (2) deethanizer towers, an ethane amine treating unit, a depropanizer, a debutanizer, and four (4) new 61.6 mmBtu/hr Hot Oil Heaters to facilitate the fractionation process;
- Addition of a 1,629,096 gallon natural gasoline storage tank using a natural gas blanket to prevent any loss of natural gasoline vapors;
- Addition of four pressurized bullet tanks for butane storage;
- Adding new intermittent streams (e.g., pressure relief valves) sent to the Main Flare;
- Addition of a second flare primarily for backup of the Main Flare; and
- Reduction of permitted annual hours of operation of the Emergency Fire Pumps from 500 to 100 hours.

Post-Modification Process Description

The following is a description of the Natrium Extraction and Fractionation Processing Plant after the proposed modifications described above are completed.

<u>Inlet Gas/Liquids Separation and Liquids Handling</u>

Natural gas from regional gas wells is, after removal of condensate and water close to the well-head, sent to the facility for processing. Inlet gas first passes through horizontal separators, or slug catchers, which separate entrained liquids from the inlet gas. The liquids are first treated in the stabilizer (application of heat provided by the 216.7 mmBtu/hr Hot Oil Heater (S001)), where the lighter components are removed and combined with the separated inlet gas for processing. The remaining liquid components are then routed to the pressurized 865,200 gallon NGL Storage/Surge Tank prior to processing in the fractionation trains. As this tank is pressurized, there are no expected

emissions. However, the tank is connected to the Main Flare in case the tank becomes depressurized due a malfunction. NGLs can also be received at the facility via pipeline, truck, railcar, or barge. Received NGLs are also stored in the pressurized NGL Storage/Surge Tank prior to processing. The NGLs unloading operations are performed under pressure, in order to prevent emissions to the atmosphere.

Water and other non-NGLs (called "slop oil") separated from the NGLs in the stabilizer are routed to the 21,000 gallon Slop Tank (S007) and hauled off site via trucks. The Slop Tank is equipped with a natural gas blanket to mitigate potential air emissions. Any emissions generated from the tank are routed via VRU to the Main Flare (C004) for control.

Natural Gas Processing

After liquids separation, the inlet gas is diverted into one of two 230 mmscf/day cryogenic gas processing trains that mirror each other (the following is an accurate description of both trains). In each train, the gas is compressed by electric compressors (no combustion emissions). Each compressor is equipped with a blowdown vent through which a small amount of natural gas is emitted during shutdown (i.e., for decompression, which is required for safety purposes). Note that these emissions are re-routed back to the inlet suction when possible. Otherwise, they are routed to the Main Flare for combustion. After compression, the gas is fed into a triethylene glycol (TEG) dehydration unit (GDU). The glycol dehydration system (S006) is used to remove any remaining water from the gas. Glycol dehydration is a liquid desiccant system used for the removal of water from natural gas. In the GDU, lean, water-free glycol is fed to the top of an absorber (known as a "contactor") where it is contacted with the wet natural gas stream. The glycol removes water from the natural gas by physical absorption and is carried out the bottom of the column.

In the GDU process, rich glycol is routed from the glycol contactor tower to the glycol reboiler, where heat from the Hot Oil Heater is used to drive off the water from the glycol. Heat for the new GDU in cryogenic train two would be provided by a 3.00 mmBtu/hr natural gas-fired reboiler (S020). Lean glycol is then returned to the contactor for reuse. The rich glycol flash tank is not vented to the atmosphere, but is routed to the Hot Oil Heater fuel header for use as fuel. The glycol regenerator still vent is routed first through a condenser for liquid removal (water that is routed to the Slop Tank), then to the inlet of the Natural Gasoline Storage Tank VRU where it is compressed and routed to the Hot Oil Heater fuel inlet.

From the GDU, the gas is routed to the molecular sieve dehydration unit, where the water content is reduced further. Two (2) 9.7 mmBtu/hr natural gas-fired Mole Sieve Regenerator Heaters (S012, S022) are used to heat a small amount of natural gas that is slip-streamed from the residue line as needed to regenerate the beds. The gas is then routed back into the system. The molecular sieve unit does not have vents to atmosphere. The residue gas from the beds that are regenerated is routed back to the residue gas stream. Therefore, the only emissions from this unit are associated with fugitive piping/equipment leaks and combustion-related emissions from the heaters. Collected water is sent to the Slop Tank.

After the molecular sieve dehydration unit, the propane-cooled cryogenic units remove heavier components to produce NGLs by cooling the stream and reducing the stream pressure. One cryogenic unit utilizes heat from the Hot Oil Heater, and one unit has a dedicated 26.3 mmBtu/hr natural gas-fired heat medium oil (HMO) heater (S013). The natural gas leaving the cryogenic units is lean and dry (i.e., pipeline quality), and it is compressed via electric-driven residue gas compressors and shipped off site via pipeline. Collected NGLs are sent to the NGL Storage/Surge Tank. The NGL liquids can be transferred back to the NGL storage/surge tank or directly into the deethanizers of the NGL fractionation trains. The only emissions from these cryogenic units are associated with fugitive piping/equipment leaks and the Cryo Unit HMO Heater. Collected water is sent to the Slop Tank.

NGL Fractionation

NGL received from the natural gas processing unit or received on-site as raw material feed is fed to a series of trayed columns for separation into constituent organic products identified above. The modified facility will contain two (2) fractionation lines with a total of three (3) deethanizer towers, two (2) depropanizers, and (2) debutanizers. At the bottom of each tower column is a reboiler that is heated by the facility's heating oil system (including four (4) new 61.6 mmBtu/hr natural gas-fired Hot Oil Heaters - S016 through S019). As the NGL stream enters a column in the middle, the reboiler vaporizes a portion of the feed to produce stripping vapors rising inside the column. This stripping vapor rises up through the column contacting down-flowing liquids allowing for the fractionation of the liquids. Vapor leaving the top of the column enters a condenser where heat is removed by a cooling medium and the vapor condensed. Liquid is returned to the column as reflux to limit the loss of heavy components overhead. The product leaving the lower part of the column has the highest boiling point, whereas the hydrocarbon leaving the top of the column has the lowest boiling point. This basic system is used in all towers to separate lighter organic components from heavier ones.

Ethane removed from the NGL stream is sent to one of the two ethane product amine units: one (1) 29 mmscfd unit (S011) and one (1) 100 mmscfd unit (S014). In these units, amine contactors are used to remove CO_2 and the trace amounts of hydrogen sulfide (H_2S) from the ethane product stream. Small amounts of hydrocarbons may also be absorbed in this process as well. In each unit, the saturated (rich) amine enters a flash tank where gaseous vapors are flashed and vented to atmosphere. After the flash tank, the liquid stream (rich amine) is routed to an amine regenerator, where heat from the facility's heating oil system volatilizes the remaining CO_2, H_2S and hydrocarbons from the rich amine stream. The lean amine is returned to the amine contactors for reuse while the waste gas from the amine regenerator is vented to the atmosphere. The amine unit vent streams are primarily (~97%) CO_2, with water and trace amounts (~0.5%) of hydrocarbons. Dried ethane is sent to a pipeline via electric compressors. The remaining separated streams (propane, butanes, and natural gasoline) are sent to appropriate product storage tanks.

Product Storage and Loadout

The facility will utilize the following product storage tanks:

Table 1: Product Storage Tanks

Emission Unit ID	Description	Material	Size (Gallons)	Control Device
S005	Natural Gasoline Storage Tank	Natural Gasoline	714,000	Natural Gas Blanket(1)
S023	Natural Gasoline Storage Tank	Natural Gasoline	1,629,096	Natural Gas Blanket(1)
n/a	Pressurized Butane Bullet Tank	Butane	90,000	None(2)
n/a	Pressurized Butane Bullet Tank	Butane	90,000	None(2)
n/a	Pressurized Butane Bullet Tank	Butane	90,000	None(2)
n/a	Pressurized Butane Bullet Tank	Butane	90,000	None(2)
n/a	Horizontal Propane Storage Tank	Propane	2,142,000	None(2)
n/a	Horizontal Isobutane Storage Tank	Isobutane	865,200	None(2)
n/a	Horizontal Normal Butane Storage Tank	Butane	865,200	None(2)
n/a	Horizontal Propane Storage Tank	Propane	865,200	None(2)

(1) Tank uses a natural gas blanket to prevent emissions of natural gasoline. Working/breathing losses of natural gas blanket are collected and sent to Hot Oil Heater as a supplemental fuel.

(2) These tanks are pressurized to prevent working/breathing losses and, therefore, have no emissions. However each is connected to the Main Flare in case the tank becomes depressurized due a malfunction.

To remove products from the facility, Blue Racer utilizes a 35,000 gpm truck, railcar, and barge loadout (S008). All loading is pressurized with vapor return (solid connections on train cars, barges, and trucks return any vapors back into the product storage tank), in order to prevent emissions to atmosphere. There was no change to the permitted throughput of material loaded out of the facility.

Flaring

The modified facility will consist of two flares: (1) a Main Flare (S004, C004) that will be used to both control continuous emissions of organic material as well as non-routine emergency events and (2) an (if determined to be necessary) Emergency Flare (S021, C021) that will act primarily as a backup to the Main Flare (but in some scenarios of emergency low volume gas releases, it will be used first to achieve better combustion).

The 376.5 foot Main Flare is a 19,800,000 scf/hr John Zink Company, KMI Model 12-26 Multipoint Tip pressure-assisted flare. The vent steam pressure shall be used to promote mixing at the burner tip. The flare will control emissions from relief valves scattered throughout the plant as

well as natural gas blow-downs during maintenance events from multiple operations within the facility. The flare has three (3) natural gas-fired pilot lights with a total heat input of 0.201 mmBtu/hr and has a rated capacity to combust up to 22.5 mmBtu/hr of waste gases with a destruction efficiency of 99.5%. Additionally, to prevent back-pressure at the flare tip, the unit will continually combust 1,300 scf/hour of natural gas (in this usage referred to as "sweep gas").

With this permitting action, Blue Racer is proposing the installation of a second "Emergency" Flare to facilitate the proper operation of the Main Flare. The unit would function as both a backup to the Main Flare in case of a malfunction of that unit and also possibly be used in some scenarios of emergency low volume gas releases to achieve better combustion that would be possible at the Main Flare. As the engineering has not yet been completed on this second flare, the size and other unit specifics are not yet known.

Diesel-Fired Engines

The facility utilizes two (2) Caterpillar C18 700 horsepower (hp) emergency diesel-fired (S002, S003) water pumps in case of fire. These engines are operated in non-emergency situations less than 100 hr/yr for testing and maintenance to ensure reliability during emergency situations.

SITE INSPECTION

On September 17, 2014, the writer conducted an announced site inspection of the Natrium Extraction and Fractionation Plant. The primary contact at the facility was Mr. Sean Wilson, Director EHS for Caimen Energy. Observations from the inspection include:

- No significant odors were detected in walking through the plant;
- Site preparation and foundation work for the new fractionation train was observed taking place. All site activities underway appeared to be within the limitations allowed pursuant to Section 5 of 45CSR13;
- The flare was observed combusting sweep gas. There was no visible opacity from the flare; and
- A water truck was observed on-site wetting down the gravel near the construction site to mitigate any excessive dust generated by vehicle traffic.

AIR EMISSIONS AND CALCULATION METHODOLOGIES

Blue Racer, in Attachment N of the permit application, provided a post-modification facility-wide potential-to-emit (PTE) for the Natrium facility and calculations for all equipment and processes at the facility. The following section will detail the air emissions and emissions

calculation methodologies used by Blue Racer to calculate the potential-to-emit of new or modified emission units only.

Hot Oil Heaters

Potential emissions from the Hot Oil Heaters (P001 and P016-P019) were based on emission factors provided by the unit vendors, as given in AP-42, Section 1.4 (AP-42 is a database of emission factors maintained by USEPA), on material balance equations, and as given in 40 CFR Part 98, Subpart C, Tables C-1 and C-2 (GHGs). Hourly emissions were based on the maximum design heat input (MDHI) of each heater (S001: 216.7 mmBtu/hr, S016-S019: 61.58 mmBtu/hr). Individual unit annual emissions were based on 8,760 hours of operation per year. A fuel gas heat content of 1,020 Btu/scf was used in the calculations. Emissions of SO_2 were based on a maximum sulfur content of the fuel gas of 4 ppm. The following tables detail the PTE of each heater:

Table 2: Per-Heater (S016-S019) PTE

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	0.059 lb/mmBtu	Heater Vendor	3.63	15.91
NO_X	0.024 lb/mmBtu	Heater Vendor	1.48	6.47
$PM_{2.5}$(1)	0.00745 lb/mmBtu	AP-42, Table 1.4-2	0.46	2.01
PM_{10}(1)	0.00745 lb/mmBtu	AP-42, Table 1.4-2	0.46	2.01
PM(1)	0.00745 lb/mmBtu	AP-42, Table 1.4-2	0.46	2.01
SO_2	7.23×10^{-4} lb/mmBtu	Material Balance	0.04	0.20
VOCs	0.0054 lb/mmBtu	AP-42, Table 1.4-2	0.33	1.46
Formaldehyde	7.35×10^{-5} lb/mmBtu	AP-42, Table 1.4-3	0.005	0.02
n-Hexane(2)	1.76×10^{-3} lb/mmBtu	AP-42, Table 1.4-3	0.11	0.47
Total HAPs(3)	1.85×10^{-3} lb/mmBtu	AP-42, Table 1.4-3	0.11	0.50
CH_4	1.00×10^{-3} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.14	0.59
N_2O	1.00×10^{-4} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.01	0.06
CO_2	53.06 kg/mmBtu	40 CFR Part 98, Subpart C, Table C-1	7,203.45	31,551.12
CO_2e(4)	n/a	n/a	7,210.89	31,583.71

(1) Filterable + Condensable.

(2) As re-calculated by the writer. Blue Racer used an n-Hexane emission factor developed from information contained in the background documents of 40 CFR 63, Subpart DDDDD that could not be verified.

(3) As re-calculated by the writer using aggregate emission factor for all HAPs.

(4) Based on multiplying the mass amount of emissions for each of the six greenhouse gases by the gas's associated global warming potential (CH_4 based on updated GWP of 25 and N_2O on updated GWP of 298) published at Table A-1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials.

Table 3: Heater (S001) PTE

Pollutant	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	0.015 lb/mmBtu	Heater Vendor	3.25	14.24
NO_X	0.026 lb/mmBtu	Heater Vendor	5.63	24.68
$PM_{2.5}$(1)	0.00745 lb/mmBtu	AP-42, Table 1.4-2	1.61	7.07
PM_{10}(1)	0.00745 lb/mmBtu	AP-42, Table 1.4-2	1.61	7.07
PM(1)	0.00745 lb/mmBtu	AP-42, Table 1.4-2	1.61	7.07
SO_2	7.23×10^{-4} lb/mmBtu	Material Balance	0.16	0.69
VOCs	0.0017 lb/mmBtu	AP-42, Table 1.4-2	0.37	1.61
Formaldehyde	7.35×10^{-5} lb/mmBtu	AP-42, Table 1.4-3	0.02	0.07
n-Hexane(2)	1.76×10^{-3} lb/mmBtu	AP-42, Table 1.4-3	0.38	1.67
Total HAPs(3)	1.85×10^{-3} lb/mmBtu	AP-42, Table 1.4-3	0.40	1.75
CH_4	1.00×10^{-3} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.48	2.09
N_2O	1.00×10^{-4} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.05	0.21
CO_2	53.06 kg/mmBtu	40 CFR Part 98, Subpart C, Table C-1	25,348.95	111,028.38
CO_2e	n/a	n/a	25,375.13	111,143.05

(1) Filterable + Condensable.
(2) As re-calculated by the writer. Blue Racer used an n-Hexane emission factor developed from information contained in the background documents of 40 CFR 63, Subpart DDDDD that could not be verified.
(3) As re-calculated by the writer using aggregate emission factor for all HAPs.

Other Process Heaters

Potential emissions from the new Regeneration Gas Heater (P022) and Glycol Reboiler (P020) were based on emission factors as given in AP-42, Section 1.4, on material balance equations, and as given in 40 CFR Part 98, Subpart C, Tables C-1 and C-2 (GHGs). Hourly emissions were based on the maximum design heat input (MDHI) of each heater (S022: 9.70 mmBtu/hr, S020: 3.00 mmBtu/hr). Individual unit annual emissions were based on 8,760 hours of operation per year. A fuel gas heat content of 1,020 Btu/scf was used in the calculations. Emissions of SO_2 were based on a maximum sulfur content of the fuel gas of 4 ppm. The following tables detail the PTE of each heater:

Table 4: Other Process Heaters (S022 and S020) PTE

Pollutant	Emission Factor	Source	Regen Heater		Glycol Reboiler	
			(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
CO	84 lb/mmscf	AP-42, Table 1.4-2	0.80	3.50	0.25	1.08
NO_X	100 lb/mmscf	AP-42, Table 1.4-2	0.95	4.17	0.29	1.29
$PM_{2.5}$(1)	7.6 lb/mmscf	AP-42, Table 1.4-2	0.07	0.32	0.02	0.10
PM_{10}(1)	7.6 lb/mmscf	AP-42, Table 1.4-2	0.07	0.32	0.02	0.10
PM(1)	7.6 lb/mmscf	AP-42, Table 1.4-2	0.07	0.32	0.02	0.10
SO_2	7.23×10^{-4} lb/mmBtu	Material Balance	0.01	0.03	0.00	0.01
VOCs	5.5 lb/mmscf	AP-42, Table 1.4-2	0.05	0.23	0.02	0.07
Formaldehyde	7.35×10^{-5} lb/mmBtu	AP-42, Table 1.4-3	~0.00	~0.00	~0.00	~0.00
n-Hexane	1.76×10^{-3} lb/mmBtu	AP-42, Table 1.4-3	0.0200	0.0700	0.01	0.02
Total HAPs	1.85×10^{-3} lb/mmBtu	AP-42, Table 1.4-3	0.02	0.08	0.01	0.02
CH_4	1.00×10^{-3} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.02	0.09	0.01	0.03
N_2O	1.00×10^{-4} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.00	0.01	0.00	0.00
CO_2	53.06 kg/mmBtu	40 CFR Part 98, Subpart C, Table C-1	1,135	4,970	351	1,537
CO_2e	n/a	n/a	1,136	4,975	351	1,539

(1) Filterable + Condensable.

Ethane Amine Regenerator

The emissions from the new ethane amine regenerator vent (P006) was calculated by using the ProMax Simulation Software. ProMax software is chemical process simulator for design and modeling of amine gas treating and glycol dehydration units. Based on a detailed input gas analysis and the components of the facility, the software can simulate and model the inputs and outputs of the system. Blue Racer provided an Excel output file of the ProMax run on the amine regenerator vents that confirm the emissions from the new unit. The inlet gas specifications entered into ProMax were based on a March 26, 2014 gas sample taken at the Inlet Contactor.

Equipment Leaks

Blue Racer based their uncontrolled VOC, CO_2, and methane fugitive equipment leak calculations on emission factors taken from the document EPA-453/R-95-017 - "Protocol for Equipment Leak Emission Estimates." Emission factors were, with only one exception (no emission factor was available for Pump Seals in Heavy Liquid Service), taken from Table 2-4: "OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)." As

stated in the document, the average emission factor approach is "one accepted approach for estimating emissions" from components in service with the oil and gas industry. This method is most effective when used, as Blue Racer is using them, "for estimating emissions from a population of equipment."

Component counts were based on actual existing component counts and proposed component counts for new and modified equipment. As the provided emission factors are for Total Organic Compounds (TOCs), VOC, CO_2, and methane contents of the serviced materials were used to determine specific pollutant emissions. Controlled emission rates were based on reduction percentages taken from the document "Control Efficiencies for TCEQ Leak Detection and Repair Programs" and "TCEQ Technical Guidance Document for Equipment Leak Fugitives." The percent reductions are dependent on Blue Racer using the 28LAER Leak Detections and Repair (LDAR) Program at the Natrium facility. The requirements of this program are given here:

http://www.tceq.state.tx.us/assets/public/permitting/air/Guidance/NewSourceReview/bpc_rev28laer.pdf

Relief Valves and Natural Gas Purging

Potential emissions from most pressure relief valves (both from Fugitive Area 2 and the general plant area) are sent to the flare for control. The uncontrolled emissions from these sources are calculated as described above under Equipment Leaks. The controlled emissions are based on a flare destruction efficiency of 99.0% and 98% depending on the organic compound.

Potential emissions from purging natural gas during maintenance events and plant blowdowns are sent to the flare for control. Potential emissions from these events are based on total annual volume of gas sent to the flare of 1 mmscf and the constituent organic makeup of the gas and a flare destruction efficiency of 99.5%.

Unpaved Haulroads

Blue Racer included in their application an updated estimate of fugitive emissions created by truck traffic (NGLs and other liquids deliveries/loadouts) at the facility. As the NDL delivery trucks travel on unpaved roads, Blue Racer used the equation given in Section 13.2.2 of AP-42 and appropriate variables to estimate potential emissions. Annual emissions were based on 21,900 trips/year and hourly emissions were (as calculated by the writer) based on a maximum of 2.5 trips/hour at 2,000 feet traveled per round trip.

Main Flare

Three sources of emissions are generated at the Main Flare (not including the uncombusted pass-through emissions from waste gases sent to the flare): (1) the products of combustion of the pilot lights, (2) the products of combustion of the sweep gas, and (3) the products of combustion of the waste gases. Pass-through (uncombusted) emissions of waste gases sent to the flare for destruction also emitted at the flare but are attributed to the PTE of the source of the waste gases. The following will discuss the emissions generated at the flare:

Products of Combustion of Pilot Light

The emissions of pollutants associated with combustion of natural gas in the flare's pilot light were based on emission factors provided by the unit vendor (NO_x, CO, and VOCs), as given in AP-42, Section 1.4 (particulate matter and SO_2), and as given in 40 CFR Part 98, Subpart C, Tables C-1 and C-2 (GHGs). Hourly emissions were based on the maximum design heat input (MDHI) of the pilot light (0.201 mmBtu/hr) and annual emissions were based on 8,760 hours of operation. A natural gas heat content of 1,029 Btu/scf was used in the calculations.

Products of Combustion of Sweep Gases

The emissions of pollutants associated with combustion of the sweep gas (natural gas) is based on emission factors from AP-42, Section 13.5 (NO_x, CO, and VOCs), AP-42 Section 1.4 (particulate matter and SO_2), and as given in 40 CFR Part 98, Subpart C, Tables C-1 and C-2 (GHGs). Maximum hourly emissions are based on a continuous input of 1,300 scf/hr of natural gas and annual emissions are based on 8,760 hours of combustion. A sweep gas heat content of 1,029 Btu/scf is used in the calculations.

Products of Combustion of Waste Gases

The emissions of pollutants associated with combustion of the waste gases (process gases from facility relief valves and natural gas from plant blowdowns) is based on emission factors from AP-42, Section 13.5 (NO_x, CO, VOCs, and particulate matter). Maximum hourly and annual emissions are based on plant experience and engineering estimates of the maximum short-term and long term amount of gases (and associated heat contents) sent to the flare for destruction.

Summary of Main Flare Emissions

The emissions from flaring are summarized in the following table:

Table 5: Main Flare PTE

Pollutant	Origin	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
CO	Pilot	0.1366 lb/hr	Vendor	0.14	0.60
	Sweep Gas	0.37 lb/mmBtu	AP-42, Table 13.5-1	0.49	2.17
	Waste Combustion	0.37 lb/mmBtu	AP-42, Table 13.5-1	2.88	0.31
			Total CO Emissions →	***3.51***	***3.07***
NO_x	Pilot	0.025 lb/hr	Vendor	0.03	0.11
	Sweep Gas	0.07 lb/mmBtu	AP-42, Table 13.5-1	0.09	0.40
	Waste Combustion	0.07 lb/mmBtu	AP-42, Table 13.5-1	0.53	0.06
			Total NO_x Emissions →	0.65	0.58

Pollutant	Origin	Emission Factor	Source	Hourly (lb/hr)	Annual (ton/yr)
PM[1]	Pilot	7.6 lb/mmscf	AP-42, Table 1.4-2	0.001	0.01
	Sweep Gas	7.6 lb/mmscf	AP-42, Table 1.4-2	0.010	0.04
	Waste Combustion	No Factor	AP-42, Table 13.5-1	0.00	0.00
			Total PM Emissions →	0.011	0.05
SO_2	Pilot	3.78×10^{-5} lb/hr	Vendor	~0.00	~0.00
	Sweep Gas	3.78×10^{-5} lb/hr	Vendor	~0.00	~0.00
	Waste Combustion	No Factor	AP-42, Table 13.5-1	0.00	0.00
			Total SO_2 Emissions →	0.00	0.00
VOC	Pilot	0.0516 lb/hr	Vendor	0.05	0.23
	Sweep Gas	0.063 lb/mmBtu	AP-42, Table 13.5-1	0.08	0.37
	Waste Combustion	0.063 lb/mmBtu	AP-42, Table 13.5-1	0.49	0.05
			Total VOC Emissions →	0.63	0.65
CH_4	Pilot	1.00×10^{-3} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.0004	0.0019
	Sweep Gas			0.0029	0.0127
	Waste Combustion			0.0000	0.0000
			Total CH_4 Emissions →	0.0033	0.0146
N_2O	Pilot	1.00×10^{-4} kg/mmBtu	40 CFR Part 98, Subpart C, Table C-2	0.0000	0.0002
	Sweep Gas			0.0003	0.0013
	Waste Combustion			0.0020	0.0002
			Total N_2O Emissions →	0.0023	0.0017
CO_2	Pilot	53.06 kg/mmBtu	40 CFR Part 98, Subpart C, Table C-1	23.5124	102.9843
	Sweep Gas			156.36	684.86
	Waste Combustion			1,847.51	107.11
			Total CO_2 Emissions →	2,027.39	894.95
			Total CO_2e Emissions →	2,028.15	895.81

(1) All PM emissions are assumed to be $PM_{2.5}$ or less and include condensables.

Emergency Flare

The emissions of pollutants associated with combustion of natural gas in the Emergency Flare's pilot light were based on emission factors as given in AP-42, Section 1.4 and as given in 40 CFR Part 98, Subpart C, Tables C-1 and C-2 (GHGs). Hourly emissions were based on the maximum design heat input (MDHI) of the pilot light (estimated to be no greater than 0.201 mmBtu/hr) and annual emissions were based on 8,760 hours of operation. A natural gas heat content

of 1,020 Btu/scf was used in the calculations. As all scenarios of the Emergency Flare combusting waste gases occur during non-routine emergency situation, there is no contribution to the facility's PTE from these events. Additionally, any sweep gas emissions from this unit were accounted for by overestimating the sweep gas emissions from the Main Flare.

Natural Gasoline Storage Tank

The new natural gasoline storage tank uses a natural gas blanket to prevent loss of natural gasoline vapors to atmosphere. Additionally, the fuel gas blanket prevents the potential ingress of atmospheric oxygen into the tank and mitigates the potential for a negative internal tank pressure to result in loss of tank integrity/tank collapse. The vapor recovery unit (VRU) installed on the tanks serves to allow breathing losses and working loses that result from tank loading and filling to return any potentially displaced fuel gas vapors from the tank back to the fuel system. The use of this natural gas blanket/VRU system will prevent any substantive VOC emissions from the new natural gasoline storage tank.

Emissions Summary

Based on the above estimation methodologies, which are determined to be reasonable (and as recalculated by the writer as-noted), and on information provided in the permit application, the post-modification short-term (hourly) PTE of the Natrium Extraction and Fractionation Plant is given in the following table (the new/modified equipment are underlined):

Table 6: Facility-Wide Hourly (lb/hr) Criteria Pollutant PTE Summary.

Source	Emission Point	CO	NO_x	$PM_{2.5}$	PM_{10}	PM	SO_2	VOCs	HAPs
Hot Oil Heater	P001	3.25	5.63	1.61	1.61	1.61	0.16	0.37	0.40
Hot Oil Heater	P016	3.63	1.48	0.46	0.46	0.46	0.04	0.33	0.11
Hot Oil Heater	P017	3.63	1.48	0.46	0.46	0.46	0.04	0.33	0.11
Hot Oil Heater	P018	3.63	1.48	0.46	0.46	0.46	0.04	0.33	0.11
Hot Oil Heater	P019	3.63	1.48	0.46	0.46	0.46	0.04	0.33	0.11
Glycol Reboiler	P020	0.25	0.29	0.02	0.02	0.02	~0.00	0.02	0.01
Regen Gas Heater	P022	0.80	0.95	0.07	0.07	0.07	0.01	0.05	0.02
Regen Gas Heater	P012	0.80	0.95	0.07	0.07	0.07	0.01	0.05	0.02
Cryo HMO Heater	P013	2.15	2.56	0.19	0.19	0.19	0.02	0.14	0.05
Fire Pump #1	P002	2.18	5.31	0.30	0.30	0.30	0.01	0.08	0.01
Fire Pump #2	P003	2.18	5.31	0.30	0.30	0.30	0.01	0.08	0.01
Fug Area 1 Leaks(1)	n/a	0.00	0.00	0.00	0.00	0.00	0.00	6.58	0.32
Fug Area 2 Leaks(1)	n/a	0.00	0.00	0.00	0.00	0.00	0.00	1.19	0.02
Main Flare(2)	P004	3.51	0.65	0.01	0.01	0.01	~0.00	0.63	~0.00

Source	Emission Point	CO	NO_x	$PM_{2.5}$	PM_{10}	PM	SO_2	VOCs	HAPs
Emergency Flare	P021	0.01	0.02	~0.00	~0.00	~0.00	~0.00	~0.00	~0.00
Waste Gases(3)	P004	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00
Amine Regen Vent	P005	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00
Amine Regen Vent	P006	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
Unpaved Roads	n/a	0.00	0.00	0.17	1.66	6.22	0.00	0.00	0.00
Facility-Wide Totals →		**29.65**	**27.59**	**4.58**	**6.07**	**10.63**	**0.38**	**11.24**	**1.30**

(1) Does not include plant relief valves that are sent to the flare for control.
(2) Products of combustion only. All waste gas combustion emissions are given here even though some small amount might be sent to the Emergency Flare.
(3) Pass-through (uncombusted) emissions from waste gases sent to flare for control only.

Based on the above estimation methodologies, which are determined to be reasonable (and as recalculated by the writer as-noted), and on information provided in the permit application, the post-modification long-term (annual) PTE of the Natrium Extraction and Fractionation Plant is given in the following table (the new/modified equipment are underlined):

Table 7: Facility-Wide Annual (tons/yr) Criteria Pollutant/GHG PTE Summary.

Source	Emission Point	CO	NO_x	$PM_{2.5}$	PM_{10}	PM	SO_2	VOCs	HAPs(4)	CO_2e
Hot Oil Heater	P001	14.24	24.68	7.07	7.07	7.07	0.69	1.61	1.75	111,143
Hot Oil Heater	P016	15.91	6.47	2.01	2.01	2.01	0.20	1.46	0.50	31,584
Hot Oil Heater	P017	15.91	6.47	2.01	2.01	2.01	0.20	1.46	0.50	31,584
Hot Oil Heater	P018	15.91	6.47	2.01	2.01	2.01	0.20	1.46	0.50	31,584
Hot Oil Heater	P019	15.91	6.47	2.01	2.01	2.01	0.20	1.46	0.50	31,584
Glycol Reboiler	P020	1.08	1.29	0.10	0.10	0.10	0.01	0.07	0.02	1,539
Regen Gas Heater	P022	3.50	4.17	0.32	0.32	0.32	0.03	0.23	0.08	4,975
Regen Gas Heater	P012	3.50	4.17	0.32	0.32	0.32	0.03	0.23	0.08	4,975
Cryo HMO Heater	P013	9.40	11.19	0.85	0.85	0.85	0.07	0.62	0.22	13,481
Fire Pump #1	P002	0.11	0.27	0.02	0.02	0.02	<0.01	<0.01	<0.01	41
Fire Pump #2	P003	0.11	0.27	0.02	0.02	0.02	<0.01	<0.01	<0.01	41
Fug Area 1 Leaks(1)	n/a	0.00	0.00	0.00	0.00	0.00	0.00	28.80	1.40	388
Fug Area 2 Leaks(1)	n/a	0.00	0.00	0.00	0.00	0.00	0.00	5.22	0.08	31
Main Flare(2)	P004	3.07	0.56	0.05	0.05	0.05	~0.00	0.68	~0.00	900
Emergency Flare	P021	0.07	0.09	0.01	0.01	0.01	~0.00	0.01	~0.00	103
Waste Gases(3)	P004	0.00	0.00	0.00	0.00	0.00	0.00	0.57	~0.00	4
Amine Regen Vent	P005	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	5,706

Source	Emission Point	CO	NO_x	$PM_{2.5}$	PM_{10}	PM	SO_2	VOCs	HAPs(4)	CO_2e
Amine Regen Vent	P006	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	19,785
Unpaved Roads	n/a	0.00	0.00	0.41	4.05	15.20	0.00	0.00	0.00	0
Facility-Wide Totals →		**98.72**	**72.57**	**17.21**	**20.85**	**32.00**	**1.65**	**44.62**	**5.65**	**289,446**

(1) Does not include plant relief valves that are sent to the flare for control.
(2) Products of combustion only. All waste gas combustion emissions are given here even though some small amount might be sent to the Emergency Flare.
(3) Pass-through (uncombusted) emissions from waste gases sent to flare for control only.
(4) As the PTE of all individual HAPs are less than 10 TPY and the PTE of total HAPs is less than 25 TPY, the Natrium Extraction and Fractionation Plant is defined as a minor (area) source of HAPs for purposes of 40 CFR 61, 40CFR63, and Title V.

The change in annual facility-wide PTE as a result of the modifications evaluated herein is given in the following table:

Table 8: Change In Facility-Wide Annual PTE

Pollutant	R13-2896B(1)	R13-2896C	Change
	tons/year	tons/year	tons/year
CO	24.10	98.72	74.62
NO_X	34.35	72.57	38.22
$PM_{2.5}$	5.94	17.21	11.27
PM_{10}	5.94	20.85	14.91
PM	5.94	32.00	26.06
SO_2	0.45	1.65	1.20
VOCs	31.03	44.62	13.59
HAPs	2.87	5.65	2.78
CO_2e	95,201	289,446	194,245

(1) Emissions taken from R13-2896B Fact Sheet.

REGULATORY APPLICABILITY

The Blue Racer Natrium Extraction and Fractionation Plant is subject to a variety of substantive state and federal air quality rules and regulations. These include the following state rules: 45CSR2, 45CSR6, 45CSR10, 45CSR13, 45CSR14, and 45CSR30. Substantive Federal regulations that apply to the facility include: 40 CFR 60 - Subpart Db, Subpart Dc, and Subpart Kb, Subpart KKK, Subpart IIII, and Subpart OOOO; and 40 CFR 63, Subpart HH, Subpart ZZZZ, Subpart DDDDD, and Subpart JJJJJJ. Each applicable rule, and Blue Racer's proposed compliance thereto, will be discussed in detail below *with respect only to those emission units added or modified as part of this permitting action.* Additionally, those rules that have questionable applicability but have been determined to not apply will also be discussed.

45CSR2: To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers.

45CSR2 "establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units." The new and modified Hot Oil Heaters, the new Regeneration Gas Heater, and the new Glycol Reboiler have each been determined to meet the definition of a "fuel burning unit" under 45CSR2 and are, therefore, subject to the applicable requirements therein. However, pursuant to the exemption given under §45-2-11, as the MDHI of the Regeneration Gas Heater and the Glycol Reboiler are less than 10 mmBtu/hr, the units are not subject to sections 4, 5, 6, 8 and 9 of 45CSR2. The only remaining substantive requirement for the Regeneration Gas Heater and the Glycol Reboiler are under Section 3.1 - Visible Emissions Standards. Each substantive 45CSR2 requirement is discussed below.

45CSR2 Opacity Standard - Section 3.1

Pursuant to 45CSR2, Section 3.1, the Hot Oil Heaters, the Regeneration Gas Heater, and the Glycol Reboiler are subject to an opacity limit of 10%. Proper maintenance and operation of the units (and use of natural gas as primary fuel) should keep the opacity of the units well below 10% during normal operations.

45CSR2 Weight Emission Standard - Section 4.1.b

The allowable particulate matter (PM) emission rate for the Hot Oil Heaters, identified as Type "b" fuel burning units, per 45CSR2, Section 4.1(b), is the product of 0.09 and the total design heat input of the units in million Btu per hour. The maximum aggregate design heat input (short-term) of the units will be 463.10 mmBtu/Hr. Using the above equation, the 45CSR2 facility-wide PM emission limit of the units will be 41.68 lb/hr. This limit represents filterable PM only and does not include condensable PM. The exemption of condensable PM is located within the 45CSR2 Appendix - which establishes compliance test procedures - by not requiring measurement of the condensable PM. The maximum potential hourly PM emissions during normal operations from the units (*including* condensables) is estimated to be 3.45 lb/hr. This emission rate is 8.28% of the 45CSR2 limit.

45CSR2 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of 45CSR2 requires testing for initial compliance with the limits under Section 3 and 4, monitoring for continued compliance, and record-keeping of that compliance. The TMR&R requirements are clarified under 45CSR2A and discussed below.

45CSR2A Applicability - Section 3

Pursuant to 45CSR2, Section 3.1(b), the owner or operator of a "fuel burning unit(s) which combusts only natural gas shall be exempt from sections 5 and 6." Therefore, there is no substantive performance testing or monitoring requirements under 45CSR2 for the fuel burning units (Hot Oil Heaters, the new Regeneration Gas Heater, and the new Glycol Reboiler).

45CSR2A Record-keeping and Reporting Requirements - Section 7

Section 7 sets out the record-keeping requirements that Blue Racer will have to meet under 45CSR2A for the fuel burning units. For units that combust only pipeline natural gas, the record-keeping requirements are limited to the date and time of start-up and shutdown, and the quantity of fuel consumed on a monthly basis.

45CSR6: To Prevent and Control Particulate Air Pollution from Combustion of Refuse

The Main and Emergency Flares each meet the definition of an "incinerator" under 45CSR6 and are, therefore, subject to the requirements therein.

Emission Standards for Incinerators - Section 4.1

Section 4.1 limits PM emissions from incinerators to a value determined by the following formula:

Emissions (lb/hr) = F x Incinerator Capacity (tons/hr)

Where, the factor, F, is as indicated in Table I below:

Table I: Factor, F, for Determining Maximum Allowable Particulate Emissions

Incinerator Capacity	Factor F
A. Less than 15,000 lbs/hr	5.43
B. 15,000 lbs/hr or greater	2.72

Based on the maximum capacity of the Main Flare of 19,800,000 scf/hr, and using the density of methane (0.0422 lb/scf) as a reasonable surrogate, the capacity of the Main Flare in lbs/hr would be approximately 835,560 lbs/hour (418 tons/hr). Using this value in the above equation produces a PM emission limit of 1,134 lb/hr. When operating correctly, there is expected to be only trace amounts of particulate matter from the flare. The writer is aware that smoking events at the Main Flare (indicative of particulate matter emissions) have been the cause of violations issued to Blue Racer by the DAQ's Compliance and Enforcement (C/E) Section. However, when operating correctly - as the C/E actions are designed to enforce - there should be only trace amounts of particulate matter from the flare.

As stated previously, the engineering has not yet been completed on the Emergency Flare, and the size and other unit specifics are therefore not yet known. However, if constructed it will, when combusting waste gases, be subject to this PM standard. It is expected that the second flare will be of a smokeless design and also, when operating correctly, produce only trace amounts of particulate matter.

Opacity Limits for Incinerators - Section 4.3, 4.4

Pursuant to Section 4.3, and subject to the exemptions under 4.4, each flare has a 20% limit on opacity during operation. Proper design and operation of the flares should prevent any significant opacity from the flares. The writer is aware that the Main Flare has experienced opacity problems from the flare and been issued violations for this reason.

45CSR10: To Prevent and Control Air Pollution from the Emission of Sulfur Oxides

The purpose of 45CSR10 is to "prevent and control air pollution from the emission of sulfur oxides." 45CSR10 has requirements limiting SO_2 emissions from "fuel burning units," limiting in-stack SO_2 concentrations of "manufacturing process source operations," and limiting H_2S concentrations in "process gas" streams that are combusted. As noted under the discussion of 45CSR2 applicability, the new and modified Hot Oil Heaters, the new Regeneration Gas Heater, and the new Glycol Reboiler are each defined as a "fuel burning unit" and, therefore, subject to the applicable requirements discussed below.

45CSR10 Fuel Burning Units - Section 3

Pursuant to §45-10-10.1, as the MDHI of the Regeneration Gas Heater and the Glycol Reboiler are less than 10 mmBtu/hr, they are exempt from the requirements of Section 3.

The allowable sulfur dioxide (SO_2) emissions from the Hot Oil Heaters, each identified as a Type "b" fuel burning unit in a Priority I Region (which includes Marshall County), per 45CSR10, Section 3.1.e, is the product of 3.1 and the total design heat input of each unit in million Btu per hour. The total design heat input of the Hot Oil Heaters are 463.02 mmBtu/hr. Using the above equation results in a SO_2 limit of 1,435.36 pounds per hour. The maximum aggregate potential SO_2 emissions from the Hot Oil Heaters are estimated to be 0.32 pounds per hour. This emission rate is only a trace of the 45CSR10 limit.

45CSR10 Testing, Monitoring, Record-keeping, & Reporting (TMR&R) - Section 8

Section 8 of 45CSR10 requires testing for initial compliance with the limits therein, monitoring for continued compliance, and record-keeping of that compliance. Interpretative Rule 45CSR10A provides guidance and clarification for complying with the testing, monitoring, recordkeeping and reporting requirements of 45CSR10.

Pursuant to §45-10-10.3 and §45-10-3.1(b), as the Hot Oil Heaters "combust natural gas, wood or distillate oil, alone or in combination," they are not subject to the Testing and MRR Requirements under Section 8 of 45CSR10 or 45CSR10A.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed changes at Blue Racer's Natrium Extraction and Fractionation Plant has the potential to increase the PTE in excess of six (6) lbs/hour and ten (10) TPY of several regulated pollutants and, therefore, pursuant to §45-13-2.17, the changes are defined as a "modification" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Blue Racer is required to obtain a permit under 45CSR13 for the modification of the facility.

As required under §45-13-8.3 ("Notice Level A"), Blue Racer placed a Class I legal advertisement in a "newspaper of *general circulation* in the area where the source is . . . located." The ad ran on August 15, 2014 in *Moundsville Daily Echo* and the affidavit of publication for this legal advertisement was submitted on August 28, 2014.

Due to the nature of the permit as a "synthetic minor" that limits "physical and operational capacity" below major stationary source thresholds under 45CSR30, pursuant to §45-13-8.5 ("Notice Level C"), the DAQ will, upon internal approval of the draft permit and this evaluation, place a "Class I legal advertisement of the agency's intent to issue in a newspaper of general circulation in the area where the source is or will be located." In addition, Blue Racer will "be required to place a commercial display advertisement as set forth in [§45-13-8.4a] and a sign as set forth in subdivision [§45-13-8.5a]."

45CSR14: Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution for the Prevention of Significant Deterioration - (NON APPLICABILITY)

The Natrium Extraction and Fractionation Plant is located in Marshall County, WV. Marshall County is classified as "in attainment" with all National Ambient Air Quality Standards except for, in certain tax districts, SO_2. The Franklin Tax District, where the Natrium facility is located, is classified as "non-attainment" for SO_2. Therefore, applicability to major New Source Review (NSR) for all pollutants except for SO_2 is determined under 45CSR14.

As the facility is a "listed source" under §45-14-2.43 ("Fossil Fuel Boilers (or combinations thereof) Totaling More than 250 Million Btu/hour Heat Input"), the individual major source applicability threshold for all criteria pollutants is 100 TPY. As given above in Table 7, the facility-wide post-modification PTE of the Natrium Extraction and Fractionation Plant is less than 100 TPY for all criteria pollutants. Therefore, the facility is not defined as a "major stationary source" under 45CSR14.

It is important to note that on June 23, 2014 in *Utility Air Regulatory Group v. Environmental Protection Agency*, the Supreme Court of the United States (SCOTUS) ruled that GHGs alone could no longer define a source as a "major stationary source." USEPA, on July 24, 2014, released guidance concerning this ruling that stated: "More specifically, the EPA will no longer apply or enforce federal regulatory provisions or the EPA approved PSD State Implementation Plan (SIP) provisions that require a stationary source to obtain a PSD permit if greenhouse gases are the only pollutant. . .that the source emits or has the potential to emit above the major source thresholds. . ."

45CSR19: Requirements fo Pre-Construction Review, Determination of Emission Offsets for Proposed New or Modified Stationary Sources of Air Pollutants and Emission Trading for Intrasource Pollutants - (NON APPLICABILITY)

Pursuant to §45-19-3.1, 45CSR19 "applies to all major stationary sources and major modifications to major stationary sources proposing to construct anywhere in an area which is designated non-attainment." As noted above, the Natrium Extraction and Fractionation Plant is located in Marshall County, WV which is classified as in attainment with all NAAQS; with the

exception for SO_2 in the areas defined as the Clay, Washington, and Franklin (where the source is located) Tax Districts. It is within this area that the facility is located. Pursuant to §45-14-2.35, the individual major source applicability threshold for all criteria pollutants is 100 TPY. As given above in Table 7, the facility-wide post-modification PTE of the Natrium Extraction and Fractionation Plant is less than 100 TPY for all criteria pollutants. Therefore, the facility is not defined as a "major stationary source" under 45CSR19.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The modified Natrium Extraction and Fractionation Plant does not meet the definition of a "major source under §112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. The post-modification facility-wide PTE (see Table 7 above) of any regulated pollutant does not exceed 100 TPY. Additionally, the facility-wide PTE does not exceed 10 TPY of any individual HAP or 25 TPY of aggregate HAPs. It is important to note that on June 23, 2014 in *Utility Air Regulatory Group v. Environmental Protection Agency*, the Supreme Court of the United States (SCOTUS) ruled that GHGs alone could no longer define a source as a "major stationary source" for the purposes of PSD or Title V. USEPA, on July 24, 2014, released guidance concerning this ruling that stated: ". . .the EPA will no longer apply or enforce the requirement that a source obtain a title V permit solely because it emits or has the potential to emit greenhouse gases above major source thresholds. . ."

However, as there are emissions sources at the facility subject to requirements promulgated under §111 or §112(r) of the Clean Air Act (specifically 40 CFR 60, Subparts Db, Dc, and Kb) that do not have a specific exemption from Title V permitting, the facility is considered a non-major "area" source subject to Title V. Source's in this classification are not required to get a Title V permit.

40 CFR 60, Subpart Db: Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units

Subpart Db of 40 CFR 60 is the federal New Source Performance Standard (NSPS) for "steam generating units" that have a Maximum Design Heat Input (MDHI) of greater than 100 MMBtu/Hr and that were constructed, modified, or reconstructed after June 19, 1984. Subpart Db contains within it emission standards, compliance methods, monitoring requirements, and reporting and record-keeping procedures for affected facilities applicable to the rule.

Pursuant to §60.40b(a), Subpart Db applies to "each steam generating unit that commences construction . . . after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than . . . 100 million Btu/hour." Subpart Db defines a "Steam Generating Unit" as "a device that combusts any fuel or byproduct/waste and produces steam or heats water or heats any heat transfer medium." The large Hot Oil Heater (S001: 216.7 mmBtu/hr) meets the above applicability requirements and is subject to the Subpart Db.

The following table outlines the criteria pollutant emission standards under Subpart Db applicable to the large Hot Oil Heater and the associated proposed emission rates:

Table 9: Subpart Db Emission Standards

Reference	Pollutant	Standard	S001 Emission Rate
§60.42b(k)	SO_2	Exempt from emission standard pursuant to §60.42b(k)(2)	0.001 lb/mmBtu
§60.43b	Particulate Matter	No emission standard given for natural gas.	0.00745 lb/mmBtu
§60.44b(a)(1)	NO_x	0.10 lb/MMBtu(1)	0.026 lb/mmBtu

(1) Low heat release < 70,000 Btu/hr-ft^3

Sections §60.45b and §60.46b outline the compliance and performance procedures for SO_2 and NO_x, respectively. Sections §60.47b and §60.48b outline the monitoring requirements that apply to steam generating units and §60.49b provides the reporting and record-keeping requirements. Blue Racer will be required to comply with all applicable requirements to determine initial and continuing compliance with the emission standards pursuant to Subpart Db.

40 CFR 60, Subpart Dc: Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units

Subpart Dc of 40 CFR 60 is the federal NSPS for "steam generating units" that have a Maximum Design Heat Input (MDHI) of less than 100 MMBtu/Hr and greater than 10 MMBtu/Hr and that were constructed, modified, or reconstructed after June 9, 1989. Subpart Db contains within it emission standards, compliance methods, monitoring requirements, and reporting and record-keeping procedures for affected facilities applicable to the rule.

Pursuant to §60.40c(a), Subpart Dc applies to "each steam generating unit that commences construction . . . after June 9, 1989, and that has a maximum design heat input capacity of. . . 100 mmBtu/hr or less, but greater than or equal to 10 mmBtu/hr." Subpart Dc defines a "Steam Generating Unit" as "a device that combusts any fuel and produces steam or heats water or heats any heat transfer medium." The new Hot Oil Heaters (S016-S0019: 61.58 mmBtu/hr) meet the above applicability requirements and are subject to the Subpart Dc. Subpart Dc does not, however, have any emission standards for combusting only natural gas. Therefore, new Hot Oil Heaters are only subject to the record-keeping and reporting requirements given under §60.48c.

40 CFR60, 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

Subpart Kb of 40 CFR 60 is the NSPS for storage tanks containing Volatile Organic Liquids (VOLs) which construction commenced after July 23, 1984. The Subpart applies to storage vessels used to store volatile organic liquids with a capacity greater than or equal to 75 m^3 (19,813 gallons). However, storage tanks with a capacity greater than or equal to 151 m^3 (39,890 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or 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 are exempt from Subpart Kb. Additionally, pursuant §60.110b(b)(2), "[p]ressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere" are exempt from Subpart Kb.

Therefore, based on the above, the four pressurized bullet tanks for butane storage are exempt from Subpart Kb. The new gasoline storage tank, is however, subject to the applicable provisions therein. Pursuant to §60.112b(b)(1) the natural gasoline storage tank is required to be equipped with a "closed vent system and control device as specified in §60.112b(a)(3)." The use of a natural gas blanket and a closed vent VRU system meets the requirements of §60.112b(a)(3). Additionally, Blue Racer will be required to meet all applicable monitoring, recordkeeping, and reporting requirements in Subpart Kb.

40 CFR 60, Subpart KKK: Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants - (PARTIAL APPLICABILITY)

Subpart KKK of 40 CFR 60 is the federal NSPS that applies to onshore natural gas processing plants that commenced construction after January 20, 1984 and before August 23, 2011. "Natural Gas Processing Plant" is defined in Subpart KKK as "any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both." The existing two (2) cryogenic trains and the existing and new fractionation trains meet this definition and are potentially subject to Subpart KKK.

The existing fractionation train was constructed prior to August 23, 2011 and subject to Subpart KKK. Concerning the existing two cryogenic trains, cryogenic train one was constructed prior to August 23, 2011, and therefore it was initially subject to this rule. However, due to the fire that occurred on September 21, 2013 in the Natrium I Demethanizer Unit, the equipment cryogenic train one had to undergo "reconstruction." Therefore, the equipment in this train would now be subject to the Leak Detection and Repair (LDAR) requirements of 40 CFR 60 Subpart OOOO and not Subpart KKK.

As the new fractionation train will be constructed after the August 23, 2011, it will not be subject to Subpart KKK.

40 CFR 60, Subpart OOOO: Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution

Subpart OOOO of 40 CFR 60 is the federal NSPS that contains requirements for a variety of natural gas production, transmission and distribution operations and facilities that commence construction after August 23, 2011. Included are requirements for affected facilities at an onshore natural gas processing plant. A "natural gas processing plant" is defined under Subpart OOOO as "any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both." The new fractionation train proposed for the Natrium Plant is, therefore, subject to the applicable requirements of Subpart OOOO.

The substantive requirement for affected facilities at natural gas processing plant is to meet the applicable Leak Detection and Repair Requirements (LDAR) conditions under Subpart VVa. Blue Racer has proposed compliance with requirements by the following:

- Pumps in light liquid service will be monitored monthly to detect leaks and will be visually inspected every calendar week for indications of liquids dripping, and will follow the protocol for leak repairs as specified in §60.482-2(a);

- Relief valves in gas service emissions will be routed to the Main Flare and will comply with the monitoring and inspection requirements of §60.482-11a in lieu of the requirements of §482-4a(a) and (b);

- Sampling connections will comply with the requirements of §60.482-5(a) through the use of closed-loop sampling that does not cause additional emissions during sampling. Also, purged process fluid is returned to the process line. However, per §60.5401(c), sampling connections are not subject to the requirements of §60.482-5(a);

- Valves in vapor service and light liquid service will be monitored monthly to detect leaks as specified in §60.482-7(a);

- Pumps, valves, and connectors in heavy liquid service and pressure relief devices in light liquid or heavy liquid service will be inspected and repaired as outlined in §60.482-8(a);

- Connectors in vapor service and light liquid service will comply with the monitoring and repair requirements of §60.482-11a; and

- Blue Racer will comply with the recordkeeping requirements of §60.486a and reporting requirements of §60.487a as well as the additional requirements of §60.5421 and §60.5422.

40 CFR 63 Subpart HH: National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities

On June 1, 2013 the DAQ took delegation of the area source provisions of 40 CFR 63, Subpart HH. Pursuant to §63.760(a)(3), as the Natrium Extraction and Fractionation Plant - an area source of HAPs (see Table 7) - "process[es], upgrade[s], or store[s] natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user," it is defined as an area source subject to the applicable provisions under Subpart HH.

Pursuant to §63.760(b)(2), each TEG GDU located at an area source that meets the requirements under §63.760(a)(3) is defined as an affected facility under Subpart HH. The requirements for affected sources at area sources are given under §63.764(d). However, for a GDU, exemptions to these requirements are given under §63.764(e): if (1) "actual annual average flowrate of natural gas to the glycol dehydration unit is less than 85 thousand standard cubic meters [3 mmscf/day] per day" or (2) "actual average emissions of benzene from the glycol dehydration unit process vent to the atmosphere are less than 0.90 megagram [1 TPY] per year."

The existing and proposed new GDU at Natrium will have potential emissions of benzene of less than 1 TPY. Therefore, these units are only subject to the applicable record-keeping requirements under §63.774.

40 CFR 63 Subpart DDDDD: National Emission Standards for Hazardous Air Pollutants for Hazardous Air Pollutants Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters - (NON APPLICABILITY)

Subpart DDDDD of 40 CFR 63 establishes national emission limitations and work practice standards for HAPs emitted from industrial, commercial, and institutional boilers and process heaters located at major sources of HAP. Pursuant to §63.7485, a boiler or process heater is applicable to Subpart DDDDD "that is located at, or is part of, a major source of HAP[s]." A major source of HAPs is defined under §63.2 as a source that "has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants" The Natrium Extraction and Fractionation Plant will not have a potential to emit of HAPs at or above this threshold and is, therefore, not subject to Subpart DDDDD (see Table 7).

40 CFR 63 Subpart JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources - (NON APPLICABILITY)

Subpart JJJJJJ of 40 CFR 63 establishes national emission limitations and work practice standards for HAPs emitted from industrial, commercial, and institutional boilers located at area sources of HAPs. An area sources of HAPs is defined as a facility that has a PTE, considering controls, in the aggregate, of less than 10 tons per year any HAP or less than 25 tons per year or more of any combination of HAPs. The Natrium Extraction and Fractionation Plant meets the definition of an area source of HAPs.

Pursuant to §63.11237, the definition of "boiler" covered under Subpart JJJJJJ is limited to "an enclosed device using controlled flame combustion in which water is heated to recover thermal energy in the form of steam or hot water." This would not include the Hot Oil Heaters as water is not used to recover thermal energy. The proposed new glycol reboiler and regenerative gas heater (it is unclear if water is used in this heater as heat transfer medium) are potentially subject to this rule. However, pursuant to §63.11195(e), as these units are exclusively "gas-fired," they are exempt from Subpart JJJJJJ.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that have a potential to be emitted from the Natrium Extraction and Fractionation Plant and that are not classified as "criteria pollutants." Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and state programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and

40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. As noted in the emissions tables above, the Natrium Extraction and Fractionation Plant has the potential to emit various HAPs. The substantive emissions of individual HAPs (>20 lbs/year) are limited to Formaldehyde (~0.15 TPY), n-Hexane (~3.78 TPY), and Methanol (0.03 TPY). The following table lists each of these HAP's carcinogenic risk (as based on analysis provided in the Integrated Risk Information System (IRIS)):

Table 10: Potential HAPs - Carcinogenic Risk

HAPs	Type	Known/Suspected Carcinogen	Classification
n-Hexane	VOC	No	Inadequate Data
Methanol	VOC	No	Not Assessed
Formaldehyde	VOC	Yes	B1 - Probable Human Carcinogen

All HAPs have other non-carcinogenic chronic and acute effects. These adverse health affects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals.* For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

AIR QUALITY IMPACT ANALYSIS

The estimated maximum emissions of the modified facility are less than applicability thresholds that would define the proposed facility as "major" under 45CSR14 and, therefore, no air quality impacts modeling analysis was required pursuant to that rule. Additionally, an air quality impacts modeling analysis pursuant to 45CSR13, Section 7 was deemed not necessary.

MONITORING, COMPLIANCE DEMONSTRATIONS, REPORTING, AND RECORDING OF OPERATIONS

There were no substantive changes to the monitoring, compliance demonstration, reporting, and recording of operations as required under R13-2896B. New equipment was integrated into the existing permit requirements.

PERFORMANCE TESTING OF OPERATIONS

The following new performance testing shall be required:

- Within 60 days after achieving the maximum rate at which the Hot Oil Heaters (S016-S019) will be operated, but not later than 180 days after initial startup, Blue Racer shall conduct, or have conducted, a performance test on one of units to determine compliance with the CO and NO_x emission limits listed under 5.1.2(b) of the draft permit. The test shall be conducted using an appropriate test method and according to the procedures given under 3.3 of the draft permit.

CHANGES TO PERMIT R13-2896B

The substantive changes made to Permit R13-2896B are:

- New emission units have been added to the Emission Units Table 1.0;
- New control devices have been added to the Control Devices Table 1.1;
- The new Hot Oil Heaters (including emission limits) were integrated into the existing Hot Oil Heater limits given in Section 5.0 of the draft permit;
- The existing Hot Oil Heater was re-permitted with limits appropriate to operation of 8,760 hours per year;
- Performance testing of the new Hot Oil Heaters were required under 5.3.2. of the draft permit;
- The new Regeneration Gas Heater was integrated into the existing Regeneration Gas Heater requirements under Section 7.0 of the draft permit;
- The emergency fire pumps were re-permitted at 100 hours of operation per year under Section 8.0 of the permit;
- The gas throughput for the glycol dehydration system was increased to 460 mmscf/day under 10.1.1. of the permit;
- The new natural gasoline storage tank was integrated into the existing natural gas storage tank requirements (and natural gas blanketing language added) under Section 11.0 and 12.0 of the draft permit;
- The new emergency flare was integrated into the existing Main Flare requirements under Section 13.0 of the draft permit;

- The second (new) fractionation train was integrated into the existing 40 CFR 60, Subpart OOOO requirements under Section 17.0 of the draft permit; and

- A new section 18.0 was added to the draft permit requiring Fugitive Area 2 to meet the requirements of the TCEQ 28LAER leak detection and repair (LDAR) program.

RECOMMENDATION TO DIRECTOR

The information provided *in the permit application* indicates that compliance with all applicable state and federal air quality regulations will be achieved. The writer is aware that the main flare has been the source of violation related to issues of high opacity (smoking). However, this matter is considered a DAQ C/E Enforcement action that is being appropriately resolved via the issuance of a Consent Order to Blue Racer. It is possible that additional permitting actions will be required by that Consent Order to resolve the violation. However, the C/E enforcement action is, at this time, proceeding independently of this permitting action. Therefore, I recommend to the Director the issuance of a Permit Number R13-2896C to Blue Racer Midstream, LLC for the proposed modification of the Natrium Extraction and Fractionation Plant located near Proctor, Marshall County, WV.

Joe Kessler, PE
Engineer

9/30/14
Date