HOLLY ENERGY PARTNERS®

February 12, 2021

Ms. Catherine Wyffels
Environmental Engineer
Utah Division of Air Quality
195 North 1950 West
Salt Lake City, Utah 84116

Sent Via Certified Mail and Email
7020 0640 0001 6860 6782
cwyffels@utah.gov

Re: Moderate Ozone Nonattainment Area Classification
Holly Energy Partners
Woods Cross Terminal

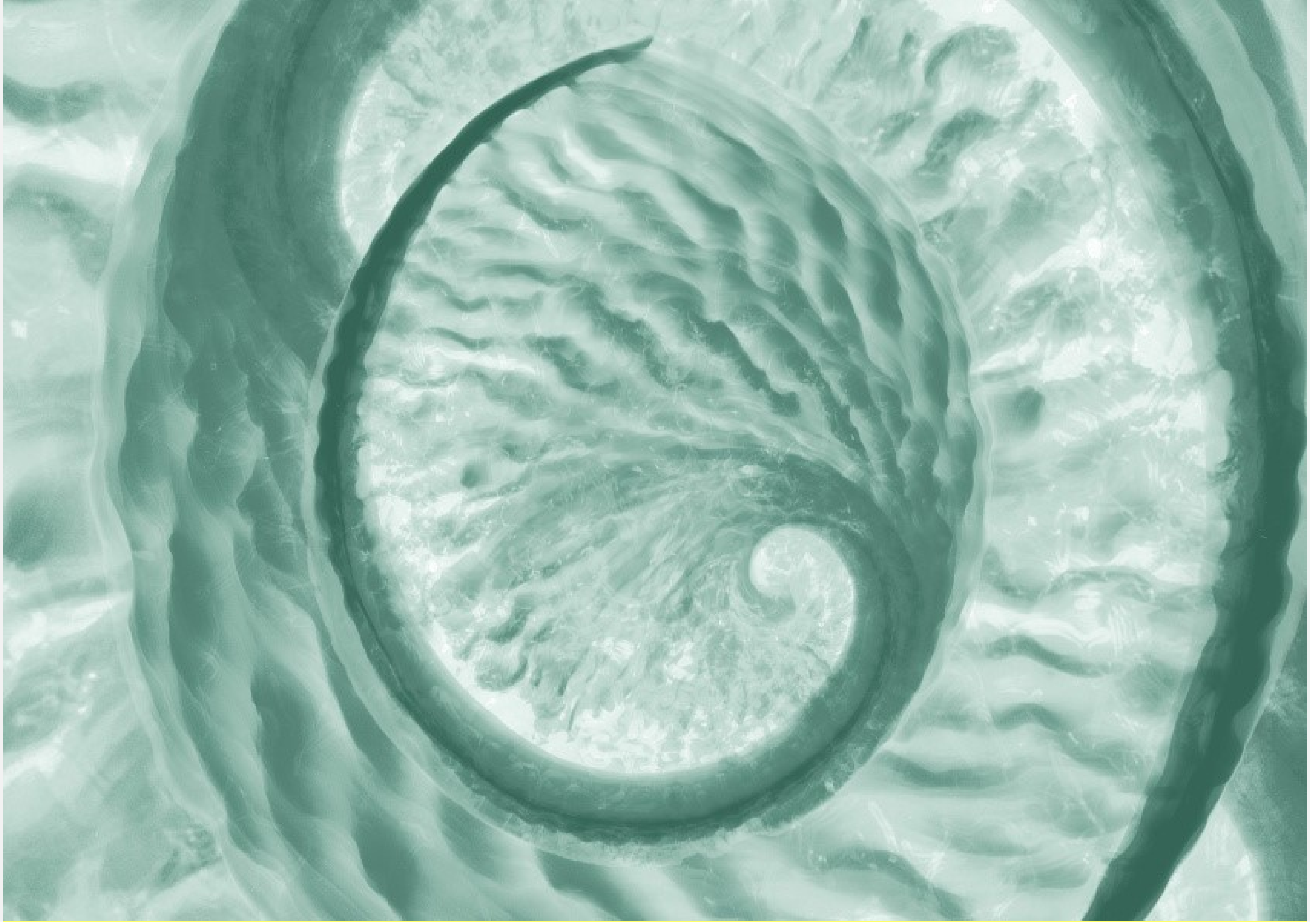
Ms. Wyffels,

In response to your email on November 5, 2020, to Mr. Eric Benson please find attached the Reasonably Available Control Technology (RACT) analysis for the Woods Cross Terminal in the Wasatch Front.

If you need further information or have questions regarding this submittal please contact me at 214-954-6712 or via email at trevor.baird@hollyenergy.com.

Sincerely,

Trevor O. Baird, P.E.
Environmental Engineer IV
Holly Energy Partners



Holly Energy Partners Woods Cross Terminal

Reasonably Available Control Technology Review

February 10, 2021

Project No.: 0550517

The business of sustainability

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1. INTRODUCTION

The Utah Division of Air Quality (UDAQ) is soliciting a reasonably available control technology (RACT) analyses for the Holly Energy Partners (HEP) Woods Cross Terminal (Terminal). The RACT analysis is being requested for emissions units that are source of oxides of nitrogen (NOx) and volatile organic compounds (VOC) from the Terminal.

On June 4, 2018, the United States Environmental Protection Agency (EPA) designated the Wasatch Front as marginal nonattainment for the 2015 eight-hour ozone standard. The portions of the Wasatch Front affected by this designation have been divided into two areas: Northern Wasatch Front and Southern Wasatch Front. The Northern Wasatch Front includes all or part of Salt Lake, Davis, Weber, and Tooele counties. The Southern Wasatch Front includes part of Utah County.

The Wasatch Front is required to attain the ozone standard by August 3, 2021. Recent monitoring data has indicated that the Southern Wasatch Front nonattainment area has attained the standard and UDAQ has initiated the process for re-designation to attainment for this area. However, recent monitoring data has indicated the Northern Wasatch Front nonattainment area will not attain the ozone standard and will be bumped up to moderate classification in early 2022. The Terminal is located in Davis County, in the Northern Wasatch Front.

This anticipated bump-up from marginal to moderate classification may trigger new control strategies requirements for major sources in the Northern Wasatch Front nonattainment area. Specifically, UDAQ's Ozone Implementation Rule requires the State Implementation Plan to include RACT measures for all major stationary sources in nonattainment areas classified as moderate or higher.

A major stationary source in a moderate ozone nonattainment area is defined as any stationary source that emits or has the potential to emit 100 tons per year or more of NOx or VOCs. The estimated potential to emit (PTE) for each criteria air pollutant for the Terminal is currently significantly below the 100 tpy major source threshold. However, recent permitting actions have established that the Terminal and the Woods Cross Refinery are considered one stationary source and therefore Terminal is currently considered a major source.

2. RACT INFORMATION REQUEST

In letter request DAQE-008-20, UDAQ provides a list of the specific information required to be submitted as part of the RACT review. A list of the information requested by UDAQ and a reference to where the specific information is located within this document is provided in Table 1 below.

Table 1. Woods Cross Terminal Emissions Inventory.

UDAQ RACT Submittal Requirements	Location of Information
A list of each NOx and VOCs emission unit at the facility. All emission units with a potential to emit either NOx or VOCs must be evaluated.	Section 3
A physical description of each emission unit and its operating characteristics, including but not limited to: the size or capacity of each affected emission unit; types of fuel combusted; and the types and quantities of materials processed or produced in each affected emission unit.	Section 3
Estimates of the potential and actual NOx and VOC emissions from each affected source, and associated supporting documentation.	Section 4
The proposed alternative NOx RACT requirement(s) or NOx RACT emissions limitation(s), and/or the proposed VOC requirement(s) or VOC RACT emissions limitation(s) (as applicable).	Section 5
Supporting documentation for the technical and economic considerations for each affected emission unit.	Not Applicable
A schedule for completing implementation of the RACT requirement or RACT emissions limitation, including start and completion of project and schedule for initial compliance testing.	Section 6
Proposed testing, monitoring, recordkeeping, and reporting procedures to demonstrate compliance with the proposed RACT requirement(s) and/or limitation(s).	Section 6
Additional information requested by DAQ necessary for the evaluation of the RACT analyses.	Not Applicable

3. TERMINAL INFORMATION

The Terminal is an existing petroleum products loading facility located at 755 West 500 South, Woods Cross, Utah 84087. The Terminal currently operates under approval order (AO) DAQE-AN0101230023B-07 for the Loading Rack and AO DAQE-AN0101230034-10 for the soil remediation system. The bulk Terminal is used by HEP to load gasoline and diesel products into tanker trucks. The Terminal receives petroleum products (gasoline, diesel, and jet fuel) via pipeline from the HollyFrontier Woods Cross Refinery. The petroleum products are loaded into tanker trucks for offsite transportation. The Terminal does not have aboveground storage tanks for petroleum products. The equipment and associated emissions inventory for the Terminal are provided in Table 2.

Table 2. Woods Cross Terminal Emissions Inventory.

Emission Unit Name	Emission Unit Description	Permitted Throughput	Pollutants	Control Equipment Installed
Loading Rack – Tanker Truck Fill	Loading bays used to load gasoline, diesel, and jet fuel into tanker trucks and to unload crude	4,500,000 bbl./year	VOC	Vapor Recovery Unit (VRU) with a Vapor Combustion Unit (backup)
Equipment Leaks	Equipment in organic HAP service as defined in 40 CFR 63.641: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, or instrumentation systems.	None	VOC	None
Soil Remediation System	Soil gas vapors from site remediation activities	None	VOC	Thermal/catalytic oxidizer

3.1 Loading Rack

The petroleum products loading rack is a primary source of VOC emissions from the Terminal. VOC emissions are associated with the loading of petroleum products into tanker trucks for offsite transport. The loading rack receives refined petroleum products (gasoline, diesel, etc.) from the adjacent Holly Frontier refinery. The Terminal currently operates under an annual throughput limit of 4.5 million barrels per 12-month period. VOC emissions generated during the loading of the tanker trucks are controlled by an existing vapor recovery unit (VRU). The VRU operates under a VOC emission limit of 10 milligram of VOC emissions per liter of gasoline loaded (mg/L) based on a 6-hour rolling average as required by 40 CFR 63 Subpart CC - National Emission Standards For Hazardous Air Pollutants From Petroleum Refineries. The Terminal also operates a vapor combustion unit (VCU) to control VOC emissions from the loading rack when the VRU is shut down for maintenance. The current AO limits the VCU operating hours to 1,056 hours/year.

3.2 Equipment Leaks

The Terminal is a source of fugitive VOC emissions associated with any potential leaks from components such as valves, connectors, pumps, etc. The annual VOC emissions from equipment leaks is primarily dependent on the number of components, the liquid associated with the component, and the associated leak rate. To minimize VOC emissions by detecting any component VOC leaks in a timely manner, the Terminal has implemented a leak detection and repair (LDAR) program. The LDAR program consists of monthly monitoring to detect and repair leaking components.

3.3 Soil Remediation System

HEP installed a Dual Phase Extraction (DPE) remediation system at the Terminal to address petroleum related soil and groundwater impacts. Primary components of the DPE remediation system include below grade extraction wells that will be used to extract groundwater and soil gas vapor. Extracted groundwater is transferred by enclosed piping to a concrete sump or junction box from where it is piped to the Holly Frontier Refinery's wastewater treatment system. Recovered soil gas VOC emissions from the DPE remediation system are treated using a Flame Oxidation System (FOD). The FOD consists of a hybrid thermal oxidation technology designed to treat high concentrations of VOCs without the need to add significant amount of dilution air to the vapor stream prior to combustion. The FOD uses the recovered soil gas as a fuel source, thereby reducing the amount of supplemental fuel required for the combustion/destruction of the VOCs in the vapor stream. As concentrations in the soil vapor decrease, supplemental fuel (i.e., natural gas) is added to maintain the necessary operating temperature. The FOD is also equipped with a catalytic oxidation module which will allow the unit to operate as a natural gas fired catalytic oxidizer once concentrations decline to appropriate levels (approximately less than 25 percent of the lower explosive limit).

4. ACTUAL AND POTENTIAL EMISSIONS

A summary of the PTE and the 2017 actual emissions for NOx and VOC emissions from the emissions inventory at the Terminal is provided in Table 3 below. For each emission unit, the table also includes the applicable emission limits as referenced from the Terminal's AO's. Details for the estimated actuals and PTE for the Terminal are included in Appendix A.

Table 3: Woods Cross Terminal – NOx and VOC PTE and 2017 Actual Emissions.

Emission Unit Name	Applicable VOC Emission Limits	Potential to Emit		2017 Actual Emissions	
		VOC	NOx	VOC	NOx
Loading Rack – Tanker Truck Fill	10 mg/L (6-hour average)	7.92 tpy	1.90 tpy[1]	1.88 tpy	0.13 tpy
Equipment Leaks	None	0.25 tpy	None	0.25 tpy	None
Soil Remediation System	0.96 ton/yr.	0.96 tpy	0.63 tpy[2]	0.01 tpy	0.19 tpy

[1] The Loading Rack – Tanker Truck Fill is not a direct source of NOx emissions. NOx emissions are formed as a by-product during the control of VOC emissions using the VCU.

[2] The Soil Remediation System is not a direct source of NOx emissions. NOx emissions are formed as a by-product during the control of VOC emissions using the thermal oxidizer.

5. RACT APPROACH

The approach used to develop the RACT is maintained consistent with UDAQ's recommended RACT process. Steps associated with a typical "top-down" RACT analysis are as follows

- Step 1: Identify All Reasonably Available Control Technologies;
- Step 2: Eliminate Technically Infeasible Control Technologies;
- Step 3: Rank Remaining Control Technologies Based on Capture and Control Efficiencies
- Step 4: Evaluate Remaining Control Technologies on Economic, Energy, and Environmental Feasibility; and
- Step 5: Select RACT.

5.1 Petroleum Products Loading RACT Analysis

5.1.1 Step 1: Identify All Reasonably Available Control Technologies

A RACT analysis must include the latest information when evaluating control technologies. Control technologies evaluated for a RACT analysis can range from work practices to add-on controls. As part of the RACT analysis, current control technologies already in use for VOCs sources can be taken into consideration.

As required by the RACT review, an assessment of the available control options and associated work practice standards was performed. The assessment focused primarily on the control of VOC emissions from the loading rack, and specifically, for the control of VOC emissions generated during the loading of petroleum products into the cargo tanks.

To support the available control technologies that are reasonably available, available US EPA and other documentation were reviewed. This included:

- US EPA RACT, BACT, LAER (RBLC) Clearinghouse Database
- Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals (EPA-450/2-77-026)
- US EPA AP-42: Compilation of Air Emissions Factors
- Other available information and literature

Search results from the EPA RBLC are included as reference in Appendix B.

Based on our review, reasonably available control options potentially available to reduce VOC emissions during the tanker truck loading operations include:

5.1.1.1 No Control – Splash Fill

Splash fill simply transfers the petroleum product into the tanker trucks. The fill pipe is partially lowered into the cargo truck while the petroleum product is dispensed thereby creating significant turbulence during the filling operation. The turbulence creates a significant amount of vapor generation with potentially entrained liquid. The generated vapors are displaced from the top of the cargo tank as the cargo tank is filled.

5.1.1.2 Submerged Loading - Submerged Fill Pipe Loading

Compared to Splash Fill, Submerged Fill Pipe Loading is primarily intended to reduce the formation of vapors and any entrained liquid as petroleum products are loaded into a tanker truck. In Submerged Fill

Pipe Loading, the fill pipe extends beyond the level of the liquid and almost to the bottom of the cargo tank. The petroleum product added to the cargo tank therefore enters the cargo vessel below the existing liquid level to minimize splash and any associated turbulence during the filling operation and thereby minimize the formation of vapors. The generated vapors are displaced from the top of the cargo tank as the cargo tank is filled.

5.1.1.3 Submerged Loading - Bottom Fill Pipe Loading

Compared to splash fill, bottom fill pipe loading is primarily intended to reduce the formation of vapors and any entrained liquid as petroleum products are loaded into a tanker truck. In bottom fill Pipe Loading, a permanent fill pipe is attached to the cargo tank bottom. Petroleum products are loaded through an opening in the tanker truck sidewall located at the bottom of the tank. The fill pipe opening is maintained below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

5.1.1.4 Refrigerated Surface Condensers

Refrigerated surface condensers extract organic vapors emitted from the tank loading operation through condensation, primary through saturation of the organic vapor and then through a phase change from vapor to liquid. In an organic vapor stream from a gasoline loading operations, the phase change is primarily accomplished through lowering the temperature of the vapor stream to the dew point of the vapor where the partial pressure of the organic compounds is equal to its vapor pressure. A non-contact refrigeration system is typically used to lower the temperature of the vapor stream where the refrigerant operates in a closed loop cycle and does not come into contact with the hydrocarbon laden vapor stream from the cargo tank. Petroleum hydrocarbons collected as part of the condensation process are recovered and returned back to the process.

5.1.1.5 Vapor Recovery Unit

Control of organic emissions using a VRU is accomplished primarily through the adsorption of the organics on the surface of a media, typically activated carbon, zeolite, or polymers. As the organic molecules are adsorbed onto the media surface, the bed becomes saturated where no additional adsorption can occur leading to breakthrough. Effective and timely regeneration of the adsorption media through steam, vacuum, or organic stripping is effective in maintaining the overall control efficiency. Typically, most control systems will employ two separate beds, one in active operation while the other bed is regenerated. Adsorption is effectively employed to remove VOCs from low to medium concentration gas streams, when a stringent outlet concentration must be met and/or recovery of the VOC is desired.

5.1.1.6 Flare

Control of organic vapors from the gasoline loading operations is primarily achieved by capturing and piping the vapor to a flare which supports the combustion of the organic vapors in an open flame or enclosed. There are several factor that determine the effectiveness of the flare to control VOC emissions such as flame temperature, residence time in the combustion zone, turbulent mixing of the components to complete the oxidation reaction, and available oxygen. Flaring of organic compounds does produce other by-products of combustion such as nitrogen oxides (NOx) and carbon monoxide (CO).

5.1.2 Step 2: Eliminate Technically Infeasible Control Technologies

5.1.2.1 No Control – Splash Fill

The splash fill option primarily designates the no control option. Petroleum products are transferred into the tanker trucks through a partially lowered pipe creating significant turbulence and associated generation of organic vapor and entrained liquid droplets. As for most gasoline loading rack, splash loading is typically not supported by design (e.g., most gasoline loading terminals will use a “skully” system to ensure proper connections are established) or will not be allowed by state or federal regulations.

Considering the control option provides no control and may not be feasible to implement at the Terminal, the splash fill control option is eliminated from further consideration.

5.1.2.2 Submerged Loading - Submerged Fill Pipe Loading

During submerged fill, the fill pipe extends beyond the surface of the liquid in the tanker truck and thereby provides for reduced organic vapor generation associated with minimizing the turbulence during tanker filling relative to splash fill loading. Although the option provides for a lesser generation of organic vapors as compared to splash loading, any vapors generated are not further controlled but simply emitted to the atmosphere. Further control of the organic vapors would be achieved by routing the vapors to an external control device such as a flare or vapor recovery unit. As most gasoline loading rack designs, submerged fill pipe loading may not be typically supported by design (e.g., most gasoline loading terminals will use a “skully” system to ensure proper connections are established).

Considering the control option provides a small relative increase in control over splash fill, will require the implementation of additional control to further reduce VOC emissions, and may not be feasible to implement at the Terminal, the submerged fill pipe loading is eliminated from further consideration.

5.1.2.3 Submerged Loading - Bottom Fill Pipe Loading

During bottom fill pipe loading, a permanent fill pipe is attached to the bottom of the cargo tank and the petroleum hydrocarbons are loaded directly below the surface of the liquid minimizing turbulence and associated vapor generation. Although the option provides for a lesser generation of organic vapors when compared to splash or submerged fill pipe loading, any vapors generated are not further controlled but simply emitted to the atmosphere. Further control of the organic vapor would be achieved by routing the vapors to an external control device such as a flare or vapor recovery unit.

Considering that the control option provides relatively increased control over splash fill and submerged loading, the submerged loading – bottom fill pipe loading control option is retained for further consideration.

5.1.2.4 Refrigerated Surface Condensers

Surface condensers support the extraction of the organic vapors from the exhaust stream from the tanker trucks by condensing the entrained organic vapors and returning the condensed hydrocarbons back to the storage tanks. Refrigeration is often employed for the condensation process and to support the removal or control efficiency. The control efficiency achieved is also dependent on the characteristics of the emissions stream including organic vapor concentration, types of hydrocarbons being condensed, the type of refrigerant being used, etc. Typical condenser unit equipment for the recovery of gasoline based hydrocarbon vapors include necessary pumps, compressors, condensers/evaporators, coolant reservoirs, the VOC condenser unit and VOC recovery tank, precooler, instrumentation and controls, and piping. Removal efficiencies of approximately 50 to 90 percent can be achieved with coolants such as chilled water and brine solutions, and removal efficiencies above 90 percent can be achieved with ammonia, liquid nitrogen, chlorofluorocarbons, hydrochlorofluorocarbons, or hydrofluorocarbons.[3]

Considering that the control option provides adequate control and can be reasonably implemented at existing loading terminals for the control of VOC emissions, refrigerated surface condensers is retained for further consideration.

5.1.2.5 Vapor Recovery Units – Carbon Adsorbers

Control of VOC emissions is primarily achieved by passing the organic vapors through a media typically carbon, zeolite, or polymers where the organic vapors adsorb onto the surface of the media. VRU types typically include fixed bed units, moving bed units, canister units, or fluid-bed adsorbers depending on their configuration. Regeneration of the media is typically achieved by thermal, vacuum or, pressure based regeneration. When properly designed, operated, and maintained, carbon adsorbers can achieve high VOC removal efficiencies of 95 to 99 percent at input VOC concentrations of between 500 and 2,000 ppm in air. Removal efficiencies greater than 98 percent can be achieved for dilute waste streams.[4]

VOC emissions generated from the top of the tanker trucks are piped directly to the VRU for control and recovery. Considering that the control option provides adequate control and can be reasonably implemented at existing loading terminals for the control of VOC emissions, VRU (Carbon Adsorbers) is retained for further consideration. It should be noted that HEP currently operates and existing carbon adsorber VRU for the control of VOC emissions during the loading of petroleum products into tankers.

5.1.2.6 Flare – Vapor Combustion Unit

Control of VOC emissions is primarily achieved through the combustion of VOC vapors assisted by supplied natural gas and excess air. The amount of combustion gas and volume of air introduced into the combustion chamber is adequately controlled to achieve the necessary control efficiency and VOC emission rate at the combustor stack outlet. Control efficiencies are typically in excess of 98% but among other factors dependent on the specific hydrocarbon in the vapors from the loading rack as well as the inlet hydrocarbon concentration. Consideration is given to the fact that the destruction of VOC forms other criteria pollutants such as NOx, CO, and HAPs.

VOC emissions generated from the top of the tanker trucks are piped directly to the VCU. Considering that the control option provides adequate control and can be reasonably implemented at existing loading terminals, the control of VOC using a VCU is retained for further consideration. It should be noted that HEP currently operates a VCU for the control of VOC emissions during the loading of petroleum products into tankers. The VCU is a backup to the existing VRU and is typically operated when the VRU is shut down for maintenance.

5.1.3 Step 3: Rank Remaining Control Technologies Based on Capture and Control Efficiencies

A summary of the estimated control effectiveness for the control technologies retained as part of Step 2 of the RACT review is provided in Table 4. The control effectiveness values are estimated based on available literature as provided in Section 5.1.2. The control options have been listed in order of those providing the highest to the lowest control effectiveness.

[3] EPA Air Pollution Control Cost Manual, Section 3, Chapter 2, Refrigerated Controls (EPA/452/B-02-001)

[4] EPA Air Pollution Control Cost Manual, Section 3, Chapter 1, Carbon Adsobers (EPA/452/B-02-001)

Table 4. Truck Loading – Control Effectiveness.

Control Option	Capture Efficiency	Control Efficiency
Vapor Recovery Units – Carbon Adsorbers	100%	95 – 99%
Flare – Vapor Combustion Unit	100%	>98%[5]
Refrigerated Surface Condensers	100%	50 to 90% (chilled water/brine coolants) >90% (ammonia, liquid nitrogen, CFC,HCFC, HFC coolants)
Submerged Loading - Bottom Fill Pipe Loading	100%	60%[6]

5.1.4 Step 4: Evaluate Remaining Control Technologies on Economic, Energy, and Environmental Feasibility

5.1.4.1 Economic Impacts

Typically, a thermal oxidation system such as a VCU is are considered less cost-prohibitive to purchase, install, and operate as compared to a vapor recovery (VRU or refrigerated surface condensers). However, the gasoline recoveries associated with a VRU or refrigerated surface condensers help offset the cost difference such as the net annualized costs are typically lower for vapor recovery.[7] For the purposes of this RACT analysis and considering that the site has existing control equipment installed a detailed assessment of the economic impacts of install a VCU, VRU, or refrigerated surface condenser is not provided.

5.1.4.2 Energy Impacts

The energy impacts for the installation and operation of a VRU, VCU, or a refrigerated surface condensers is not considered significant. Energy is required for the operation of the necessary compressors, pumps, and other equipment for the proper operation of the control device. In a VCU, additional energy costs are associated with the use of gaseous fuel (usually natural gas) to support the control of VOC emissions.

5.1.4.3 Environmental Impacts

There are no significant environmental impacts associated with the use of VRU’s, VCU’s, or refrigerated surface condensers. For VRU’s consideration may need to be given for use and disposal of spent carbon, however, most current VRU systems support the in-place regeneration of activated carbon using dual carbon beds. For VCU’s, consideration will need to be given to the formation of criteria pollutants, primarily NOx and CO, as a by-product of the combustion of gasoline vapors. Similar to the VRU, a refrigerated surface condenser may need consideration of the overall environmental impacts considering the type refrigerant used.

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[5] Besides other factors, control efficiency is dependent on the specific hydrocarbon in the vapors from the loading rack as well as the inlet hydrocarbon concentration.

[6] Control efficiency estimated based on the uncontrolled emissions factor for submerged loading (dedicated normal service) and splash loading (dedicated normal service) as referenced from US EPA AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids (July 2008)

[7] Control if Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026

5.1.5 Step 5: Select RACT

HEP is currently proposing either a VCU or a VRU as RACT for the Terminal. Both control technologies provide equivalent control and can be readily implemented considering the economic, environmental, and energy impacts.

Please note that HEP currently operates a VRU and a VCU at the Terminal. The VRU is considered the primarily control mechanism, with a permitted emission limit of 10 mg-VOC/L (6-hour rolling average). The VCU is only operated when the VRU is shut-down for maintenance. Considering that the Terminal currently operates a VRU with a VCU as backup, HEP contends that it has already implemented RACT for VOC emissions from the truck loading operations.

5.2 Equipment Leaks

5.2.1 Step 1: Identify All Reasonably Available Control Technologies

The Terminal is a source of small quantities of VOC emissions associated with onsite equipment components such as valves, flanges, compressors, and piping. Typically, facilities that are source of such fugitive VOC emissions implement onsite maintenance procedure to identify and eliminate equipment leaks. Additionally, certain facilities may be subject to state or federal standards that may require the implementation of a LDAR program to identify and eliminate leaks, thereby further minimizing VOC emissions.

A RACT analysis must include the latest information when evaluating control technologies. Control technologies evaluated for a RACT analysis can range from work practices to add-on controls. As part of the RACT analysis, current control technologies already in use for VOCs sources can be taken into consideration.

As required by the RACT review, an assessment of the available control options and associated work practice standards was performed. The assessment focused primarily on the control of VOC emissions from fugitive equipment leaks.

Based on a review of the US EPA’s RBLC database, the database identified no control option for reducing emissions from piping component fugitives. Therefore, based on our review of existing work practices typically implemented to reduce fugitive VOC emissions, the following control options were evaluated.

5.2.1.1 Leak Detection and Repair - Audio Visual Olfactory

The LDAR audio, video, olfactory (AVO) control option typically includes conducting site surveys for equipment leaks and relying on sight, sound, and smell to identify and locate equipment leaks and qualitatively assess the concentration of the leak. Surveys can be completed at varied frequencies considering a facility’s maintenance schedule or the frequency may be driven by a regulatory requirement.

5.2.1.2 Lead Detection and Repair – Instrument Monitoring

An LDAR instrument based monitoring program typically includes conducting site survey for equipment leaks using an instrument (flame ionization detector, photoionization detector, or infrared camera, etc.) to identify and locate equipment leaks and quantitatively assess the concentration of the leak. Surveys can be completed at varied frequencies considering a facility’s maintenance schedule or the frequency may be driven by a regulatory requirement.

5.2.2 Step 2: Eliminate Technically Infeasible Control Technologies

Implementation of a LDAR program using AVO or instrument based monitoring are considered technically feasible and are therefore retained for further consideration.

5.2.3 Step 3: Rank Remaining Control Technologies Based on Capture and Control Efficiencies

Based on best practices guidance developed by the US EPA, the control effectiveness of an LDAR program can vary significantly (45 to 95 percent). Many factors attribute to this variability including the type of LDAR program (monitoring frequency, leak rate definitions, types of components, etc.) and the type of facility (refinery, chemical processing, etc.). Further, the control effectiveness of an AVO inspection program is difficult to assess and is generally intended as a supplementary program only. Therefore, a general control effectiveness has not been established for AVO inspection programs.

5.2.4 Step 4: Evaluate Remaining Control Technologies on Economic, Energy, and Environmental Feasibility

The implementation of an AVO or instrument based LDAR program have similar consideration in terms of the economic investment made by HEP for implementation of the programs. Typically, both the AVO based and instrument programs can be implemented by the facility itself. Instrument based monitoring program may require hiring external contractors to support the proper implementation of the program considering personnel availability, training, instrumentation requirements, etc. Energy and environmental feasibility are not given further consideration in this assessment considering the nature and type of controls being considered.

5.2.5 Step 5: Select RACT

Considering the additional investment needed by the Terminal to support an instrument based LDAR program either supported by external contractor or by site personnel, HEP is currently proposing an AVO based LDAR program as RACT for the fugitive emissions from components.

It should be note that the Terminal is currently considered an affected source under the requirements of new source performance standard (NSPS) 40 CFR 60 Subpart VVa and has implemented an instrument based LDAR program to identify and eliminate leaks to reduce VOC emissions. Considering that HEP currently implements an instrument based LDAR program at the Terminal, HEP contends that it has already implemented RACT for fugitive VOC emissions equipment components.

5.3 Soil Remediation System

The DPE system is a source of VOC emissions. VOC emissions from the DPE system are controlled using a FOD system which consists of a hybrid thermal oxidation technology designed to treat high concentrations of VOCs and a catalytic oxidation module which will allow the unit to operate once concentrations decline to appropriate levels (approximately less than 25 percent of the lower explosive limit). Overall, the existing DPE system provide a 99% control of VOC emissions relative to the inlet concentration.

Considering the control effectiveness of the FOD system, HEP contends that it has implemented an effective form of VOC emissions control and therefore HEP contends that it has already implemented RACT for VOC emissions the DPE system.

6. RACT COMPLIANCE AND IMPLEMENTATION SCHEDULE

As requested by UDAQ, Table 5 includes information regarding proposed testing and monitoring as well as a schedule for completing implementation of RACT.

Table 5. RACT Compliance and Implementation Schedule.

Requested Information	HEP Response
The proposed testing, monitoring, recordkeeping, and reporting procedures to demonstrate compliance with the proposed RACT requirement(s) and/or limitation(s).	HEP is not proposing any additional testing, monitoring, recordkeeping, and reporting procedures to demonstrate compliance with the RACT requirements or limitation. The requirements identified in AO DAQE-AN0101230023B-07 for the Loading Rack and AO DAQE-AN0101230034-10 for the DPE system are considered adequate for compliance with the RACT requirements.
A schedule for completing implementation of the RACT requirement or RACT emissions limitations by late 2023, including start and completion of project and schedule for initial compliance testing	With this RACT analysis, HEP asserts that the control strategies proposed by HEP as RACT have already been implemented at the Terminal and a schedule for completing implementation of RACT, including any initial compliance testing, is not required.

APPENDIX A ACTUAL AND POTENTIAL EMISSIONS, NOx AND VOC

Appendix A - Actual and PTE

Emission Unit Name	Emission Unit Description	Permitted Throughput Limit	Operating Hour Limit	VOC Emission Limit	Existing Controls	NSPS/NESHAP Applicable	PTE		2017 Actual Emissions	
							VOC	NOx	VOC	NOx
Loading Rack	Loading bays used to load gasoline, diesel, and jet fuel onto tanker trucks and to unload crude	4,500,000 bbl	1,056 hours/yr (VCU only)	10.00 mg/L	Vapor Recovery Unit (VRU) Vapor Combustion Unit (VCU) (backup)	40 CFR 60 Subpart XX	7.92 tpy	1.90 tpy	1.88 tpy	0.13 tpy
Equipment Leaks	Equipment in organic HAP service as defined in 40 CFR 63.641: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, or instrumentation systems.	None	None	None	Leak inspections	40 CFR 60 Subpart VVa	0.25 tpy	Not Applicable	0.25 tpy	Not Applicable
Soil Remediation System	Soil gas vapors from site remediation activities	None	None	VOC - 0.96 tpy	Thermal/catalytic oxidizer	40 CFR 63 Subpart GGGGG	0.96 tpy	0.63 tpy	0.01 tpy	0.19 tpy

LOD NOx PTE

Permitted VCU Annual Operating Hours =	1,056.00 hours
Maximum estimated vapor flow rate =	601.00 scfm
Estimated NOx Emission Factor =	100.00 lb/MMscf
NOx PTE =	1.90 tpy

Conversion Factors

1 mg =	1,000	gram
1 lb =	453.59	gram
1 gallon =	3.8	Liters
1 bbl. =	42	gallon
1 ton =	2,000	lb
1 hour =	60	minutes

APPENDIX B RBLC DATABASE REVIEW

RBLCID	FACILITY_NAME	FACILITY_STATE	SIC_CODE	PERMIT_ISSUANCE_DATE	FACILITY_DESCRIPTION
CA-1226	SFPP,LP	CA	5171	6/21/2011	
IN-0231	COUNTRYMARK REFINING & LOGISTICS, LLC	IN	5171	6/30/2015	BULK STORAGE AND WHOLESALE PETROLEUM PRODUCTS
IN-0243	MARATHON PETROLEUM COMPANY LP	IN	5171	8/14/2015	STATIONARY PETROLEUM STORAGE AND DISTRIBUTION TERMINAL. SOURCE HAS NEW NAME
IN-0244	COUNTRYMARK REFINING AND LOGISTICS, LLC	IN	5171	12/3/2015	STATIONARY BULK PETROLEUM STORAGE AND WHOLESALE FACILITY.
NJ-0083	COLONIAL PIPELINE CO LINDEN JCT TANK FARM	NJ	4613	3/11/2014	Petroleum pipeline breakout station
TX-0656	GAS TO GASOLINE PLANT	TX	2911	5/16/2014	Chemical Plant
TX-0661	OILTANKING APPELT TERMINAL	TX	2911	6/30/2014	For Hire Terminal

RBLCID	PRIMARY_FUEL	THROUGHPUT	THROUGHPUT_UNIT	POLLUTANT	CONTROL_METHOD_DESCRIPTION	EMISSION_LIMIT_1	EMISSION_LIMIT_1_UNIT
CA-1226	GASOLINE	330	GPM TRANSFER PUMP	VOC	DIRECT PUMP TO IFR TANK THROUGH DEAERATOR	7.24	LB/D
IN-0231	Unknown	46,200	GAL/H	VOC	Test method - 1	35	MG/LITER
IN-0243	GASOLINE	741	MMGAL	VOC	VAPOR RECOVERY UNIT (CARBON ADSORPTION)	0.159	LB/GAL
IN-0244	GASOLINE	405	MMGAL	VOC	RELIEF STACK, A VAPOR KNOCKOUT BOX, AND A FLARE VAPOR CONTROL UNIT	35	MG/L
NJ-0083	Gasoline	442	MMgal/yr	VOC	Vapor Recovery Unit	0.42	LB/H
TX-0656	Unknown	300,000,000	GAL/YR	VOC	WATER SCRUBBER	1.38	T/YR
TX-0661	Unknown	0		VOC	99.5% DRE	156.16	POUND

RBLCID	CASE-BY-CASE_BASIS	OTHER_ APPLICABLE_REQUIREMENTS	PERCENT_EFFICIENCY
CA-1226	OTHER CASE-BY-CASE	OTHER	0
IN-0231	OTHER CASE-BY-CASE		0
IN-0243	OTHER CASE-BY-CASE		0
IN-0244	OTHER CASE-BY-CASE	NSPS , NESHAP	0
NJ-0083	LAER	MACT , OPERATING PERMIT , NSPS , OTHER	95
TX-0656	BACT-PSD		99
TX-0661	LAER	MACT	99.5