TESORO

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HAND DELIVERED

November 29, 2012

Marty Gray, Major NSR Section Manager
Utah Division of Air Quality
195 North 1950 West
P.O. Box 144820
Salt Lake City, Utah 84114-4820

$500.00

Re: Tesoro Salt Lake City Refinery: Gasoline Hydrotreater Conversion Project to Include Kerosene Service as New Method of Operation NOI Submittal

187867

Dear Mr. Gray:

Enclosed please find a Notice of Intent (NOI) application for the Gasoline Hydrotreater Conversion Project to Include Kerosene Service as New Method of Operation Project. This project will occur at the Tesoro Refining and Marketing Company's (Tesoro's) Salt Lake City (SLC) Refinery which operates under Approval Order (AO) DAQE-AN0103350058-12.

Also included is a check for $500 which covers the NSR Filing Fee (Existing Major Source with a Minor Modification) for the NOI application.

Please contact me at 521-4966 or Michelle Bujdoso at 366-2036 if you need more information or have questions.

Sincerely,

Matthew Buell
Health, Safety and Environmental Manager

Enclosures

Gasoline Hydrotreater Conversion Project to Include Kerosene Service as New Method of Operation

Notice of Intent for an Approval Order

Prepared for
Tesoro Refining and Marketing Company
Salt Lake City Refinery

November 2012

TESORO

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Gasoline Hydrotreater Conversion Project to Include Kerosene Service as New Method of Operation

Notice of Intent for an Approval Order

November 2012

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1.0 Introduction

This Notice of Intent (NOI) package is submitted for approval of the Gasoline Hydrotreater (GHT) Conversion Project to Include Kerosene Service as New Method of Operation (Project) at the Tesoro Refining and Marketing Company's (Tesoro's)[1] Salt Lake City (SLC) Refinery. The SLC Refinery currently operates under multiple Approval Orders (AOs), of which DAQE-AN0103350058-12 for the major process units and DAQE-AN103350059-12 for the transport loading rack and northwest tank farm are affected by this Project.[2] The SLC Refinery is situated on 236 acres in Salt Lake County, approximately 1.5 miles north of Salt Lake City.

This Project will convert the method of operation of the existing GHT into Kerosene Hydrotreater (KHT) service during the winter months or when otherwise economically viable. Minor operational and equipment changes are needed to complete this conversion. The Project will not result in a significant emission increase or significant net emission increase in air emissions of a regulated New Source Review (NSR) pollutant from the refinery; therefore, the Project is not subject to federal NSR requirements as provided in Utah's State Implementation Plan (SIP).

Rule R307-401-3(b) requires submittal of an NOI to "make modifications or relocate an existing installation which will or might reasonably expected to increase the amount or change the effect of, or the character of, air contaminants discharged, so that such installation may be expected to become a source or indirect source of air pollution." Rule R307-401-5 requires that the NOI must contain specific information related to the process, nature of emissions, control device(s), and regulatory applicability and compliance. This NOI includes a project description, an emissions summary, and a description of regulatory applicability and demonstration of compliance to address these requirements.

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[1] Tesoro is currently in the process of a name change to Tesoro Refining & Marking Company LLC, and expects the name change to be finalized during processing of this NOI. Tesoro requests that the Approval Order indicate the new name for the permittee.

[2] As of April 27, 2011, the transport loading rack and northwest tank farm are owned and operated by Tesoro Logistics Operations, LLC. These emission units are considered to be part of the same stationary source as the refinery for the purposes of New Source Review applicability.

This NOI is organized as follows:

- Section 2.0 contains a project description,
- Section 3.0 contains the emissions summary,
- Section 4.0 contains a description of regulatory applicability and compliance demonstration,
- Section 5.0 contains a summary of the NOI requirements,
- Attachment A contains a site diagram,
- Attachment B contains the project emission calculations,
- Attachment C contains Form 1 and the NOI checklist.

2.0 Project Description

This section includes a general description of the facility and details of the proposed Project.

2.1 General Facility Information

The Tesoro Salt Lake City Refinery is located at 474 West 900 North, Salt Lake City, Utah. The refinery is located in a nonattainment area for $PM_{2.5}$ (including precursor SO_2)[3], PM_{10} (including precursors SO_2 and NO_x)[4], and SO_2. The area is also a designated maintenance area for ozone (VOC and NO_x) and CO. Attachment A includes a figure that shows the location of the refinery in Salt Lake City.

2.2 Project Description

This Project will convert the method of operation of the existing GHT into KHT service during the winter months or when otherwise economically viable. Tesoro has assumed year-round operation in KHT mode to conservatively estimate the emissions increase resulting from the Project. Minor operational and equipment changes are needed to complete this conversion.

The proposed modification of the GHT to accommodate KHT service will allow the unit to produce jet kerosene when economic conditions are favorable in lieu of producing gasoline. The SLC refinery plans to desulfurize three (3) thousand barrels per day (Mbpd) of light diesel and provide back-end blending capability of jet kerosene into distillate fuel oil #2 from the GHT and DDU rundown streams.

In normal operation, the GHT utilizes Axen's Prime-G technology to desulfurize heavy naphtha (HCN) from the fluidized catalytic cracking unit (FCCU). The unstabilized gasoline from the reaction section is processed through the stabilizer tower to control the Reid Vapor Pressure (RVP) of the finished gasoline product to blending. The GHT product is transferred from the stabilizer tower to tankage.

In order for the GHT to operate in KHT mode, a few modifications are needed to facilitate the processing of light diesel, which are as follows:

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[3] 40 CFR 51, Appendix S, II.A.31, in effect until a $PM_{2.5}$ State Implementation Plan for the air quality control region is finalized.

[4] Utah PM_{10} Maintenance Provisions for Salt Lake County, Section IX.A.10, July 6, 2005.

- The stabilizer reboil medium will be switched from steam to reactor effluent. Piping connecting the reactor effluent to the reboiler will be installed, with process controls to regulate reboiler temperature. This change is needed because the steam that is used during GHT operation will no longer provide enough heat duty during KHT operation. This increase in heat will require physical modifications in the reboiler in order to handle the higher temperature of the reactor effluent stream.
- As a result of utilizing reactor effluent in the reboiler, the feed/effluent heat exchanger duty is lowered. This makes it necessary to increase the firing of the GHT Reactor Charge Heater F-701 in order to preheat the feed to optimal temperature.
- A pump will be installed to pump jet kerosene product from the stabilizer tower to tankage. The new pump is necessary due to the lower stabilizer tower pressure while operating in KHT mode.

Minor control changes and outside battery limit piping changes are also needed to complete the Project. These changes include facilities for back-end blending of jet kerosene into distillate fuel oil #2 and level control for the KHT Stabilizer.

2.3 Affected Non-Modified Emission Units

The following emission units will not be modified but are considered affected by the Project.

2.3.1 GHT Reactor Charge Heater F-701

The GHT Reactor Charge Heater F-701 will be required to increase firing by approximately 3.1 MMBtu/hr on an annual average basis to operate in KHT mode. This increase in firing is due to the decreased duty in the feed/effluent heat exchanger.

2.3.2 Sulfur Recovery Unit (SRU)

The SRU will experience an increase in sulfur loading as a result of the increased utilization of the distillate desulfurization unit (DDU) and the change in feed from HCN to light diesel to the GHT. Light diesel has higher sulfur content than HCN, which results in an increase in sulfur loading to the SRU. The overall sulfur loading to the SRU will increase by approximately 470 lb/day.

2.3.3 Distillate Desulfurization Unit (DDU) Charge Heater F-680

The DDU will experience an increase in firing by approximately 0.97 MMBtu/hr during operation in KHT mode. The increase in firing is a result of additional distillate fuel oil #2 being produced during KHT operations, which is then fed to the DDU to reduce the sulfur content.

2.3.4 Jet Kerosene Storage Tanks – TK-246 and TK-247

The throughput of jet kerosene storage tanks will increase by approximately be 2.4 Mbpd during operation in KHT mode due to the increased production rates.

2.3.5 Distillate Fuel Oil #2 Storage Tanks – TK-204, TK-212, and TK-213

The throughput of distillate fuel oil #2 storage tanks will approximately be 685 bpd during the winter months and 3.5 Mbpd during the summer months due to the increased production rates, an annual average of 2.3 Mbpd.

2.3.6 Loading Rack Impacts

The completion of the Project will result in an increase in loading of jet kerosene and distillate fuel oil #2 products at the Truck Loading Rack.

2.4 Emission Units Not Affected by Project

The Project does not relieve constraints of any other process units. There is no additional steam make required due to the utilization of reactor effluent in the reboiler. There is also no increase in electrical demand resulting from the proposed changes.

The following permitted units at the Salt Lake City Refinery will not experience increased utilization as a result of implementing the proposed Project scope:

- H-101 Crude Unit Furnace (PS #1)
- F-1 Ultraformer Unit (UFU) Furnace (PS #2)
- F-15 UFU Regeneration Heater (PS #3)
- FCCU/CO Boiler (PS# 4)
- F-681 DDU rerun reboiler
- K1s Hydrogen Compressors (PS# 6)
- South Flare (PS# 7)
- North Flare (PS# 8)
- CO Boiler Bypass (PS# 9)
- Fuel Gas Desulfurization Unit/Sour Water Stripper (FGDU/SWS) Flare (PS# 11)
- Emergency/ Standby Sources
- Benzene Saturation Unit (BSU)
- Cogeneration Units (CG1 & CG2)

- Other storage tanks (except TK-204, TK-212, TK-213, TK-246, and TK-247 described as affected units)

2.5 Project Schedule

The estimated start of construction is May 1, 2013, pending permit approval. The Project can be completed without a unit shutdown. The system is expected to begin operations on June 1, 2013, assuming permit approval by the estimated date for start of construction.

2.6 Relationship to Waxy Crude Processing Project

Tesoro has considered the relation of this Project with the recently permitted Waxy Crude Processing Project.[5] Tesoro has considered whether the projects need to be aggregated for purposes of federal New Source Review (NSR) applicability as a single "physical change." EPA's opinion letter to 3M regarding the company's facility in Maplewood, Minnesota is often cited for its general statement of EPA's position on aggregation principles.[6] In the 3M-Maplewood Memo, EPA indicated that projects should be aggregated when individually they are not economically or technically viable. EPA enumerated the following five criteria for evaluation of this issue:

> (1) Filing of more than one minor source or minor modification application associated with emissions increases at a single plant within a short time period.
>
> (2) Applications for commercial loans . . . to see if the source has treated the projects as one modification for financial purposes.
>
> (3) Reports of consumer demand and projected production levels.
>
> (4) Statements of authorized representatives of the source regarding plans for operation. And,
>
> (5) EPA's own analysis of the economic realities of the projects considered together.

Most of these factors are aimed at evaluating the applicant's intent and the economic realities surrounding a project. For instance, where it appears obvious that a proposed source or modification, by its physical and operational design characteristics, could not economically be run at minor source levels for an appreciable length of time without modifications included in the second proposed project, aggregation may be appropriate.

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[5] Authorized by AOs DAQE-AN0103350058-12 and DAQE-AN103350059-12 on September 13, 2012.

[6] See "Applicability of New Source Review Circumvention Guidance to 3M-Maplewood, Minnesota" (EPA, June 17, 1993) ("3M-Maplewood Memo").

Tesoro has conducted an evaluation of whether these projects should be aggregated as a single physical change below:

- Tesoro has developed this Project during the same timeframe as the Waxy Crude Processing Project. The application of the Waxy Crude Processing Project was filed on December 21, 2011.
- The projects have not been considered as a single modification for financial purposes. Tesoro has developed and funded these projects separately.
- The projects are not technically or economically dependent upon each other for the following reasons:
    - The projects do not involve physical changes to the same process units. This Project involves physical changes to only the GHT process unit. The Waxy Crude Processing Project did not involve any physical changes to the GHT process unit.
    - The ability and economic incentive to improve utilization of the GHT exists regardless of completion of the Waxy Crude Processing Project. There are no changes that are part of the Waxy Crude Processing Project that are necessary for operation of the GHT in KHT mode. Completion of the Waxy Crude Processing Project may actually reduce the economic incentive to operate in KHT mode due to the planned upgrades to the DDU to provide additional desulfurization capacity.
    - Operation of the GHT in KHT mode will not improve the refinery's ability to process waxy crudes. The Waxy Crude Processing Project includes upgrades to the DDU to accommodate desulfurization of additional light diesel produced at the refinery as a result of processing additional waxy crudes. Operation of the GHT in KHT mode is not necessary for processing of additional waxy crudes.
- Most importantly, aggregation of the two projects would not result in applicability to federal NSR, and both projects independently are not applicable to federal NSR.

Due to these factors, the two projects should not be aggregated as a single physical change under federal NSR.

3.0 Emissions Summary

The Utah Department of Environmental Quality Division of Air Quality (UDAQ) requires a comparison of the emissions before and after the Project. This comparison is provided below in Section 3.1. Applicability of the Prevention of Significant Deterioration (PSD) and Major Non-Attainment NSR programs is based on a calculation of actual annual emission increases as described in Section 3.2. Emission increases of hazardous air pollutants (HAP) are described in Section 3.3 for informational purposes. Detailed emission calculations are provided in Attachment B.

3.1 Emission Calculation Methodology

Permits are required for new or modified sources which will or might reasonably be expected to increase the amount or change the effect of air contaminants discharged under R307-401. There will be no increase in PTE at any emission units affected by the Project, with the exception of VOC emissions resulting from new equipment (e.g., valves and flanges) in VOC service. Tesoro does expect an increase in actual emissions and is therefore required to obtain an Approval Order under R307-401.

In addition, pollutant-specific emission calculations must also be completed to determine whether a major modification will occur under R307-403 for nonattainment and maintenance areas and under R307-405 for attainment areas. The definitions of major modification differ under the two programs; however, the calculation of emission increases is consistent between the programs for emission units affected by this Project as described below.

3.1.1 R307-403: Nonattainment and Maintenance Areas

For R307-403, a major modification is defined under R307-101-2 as *"any physical change in or change in the method of operation of a major source that would result in a significant net emissions increase of any pollutant... "*. The net emissions increase is quantified as *"the amount by which the sum of the following exceeds zero: (1) any increase in actual emissions from a particular physical change or change in method of operation at a source... "*.

"Actual Emissions" means the actual rate of emissions of a pollutant from an emissions unit determined as follows:

> *"(1) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operations. The Executive*

Secretary shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the unit's actual operating hours, production rates, and types of materials processed, stored, or combusted during the selected time period.

(2) The Executive Secretary may presume that source-specific allowable emissions for the unit are equivalent to the actual emissions of the unit.

(3) For any emission unit, other than an electric utility steam generating unit specified in (4), which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date."

These definitions are consistent with the federal NSR program prior to changes implemented as part of the 2002 NSR Reform rulemaking.[7] Paragraph (1) indicates that actual emissions for existing emission units before the Project is equal to the annual emissions actually emitted during a two-year period preceding the Project. The emissions after the Project are calculated for different types of affected emission units as follows:

- For non-modified emission units, EPA allows for calculating the emissions increase as the product of the potential increase in throughput due to the Project and an emissions factor representative of "worst-case" operations.[8,9]
- For existing modified emission units, paragraph (3) requires use of the potential to emit to represent post-Project emissions. There are no existing modified emission units as part of this Project.
- Finally, the increase in actual emissions associated with new emission units is equal to the potential to emit because actual emissions prior to the Project are equal to zero, and paragraph (3) requires use of potential to emit to represent post-Project emissions.

3.1.2 R307-405: Attainment or Unclassified Areas

The Utah rules, approved by EPA on July 15, 2011, reference the PSD rules in effect on July 1, 2008. For purposes of determining the applicability of the proposed Project, the PSD rules at 40 CFR 52.21 are incorporated by reference into the Utah rules with one exception relevant to this analysis. The

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[7] 67 FR 80186

[8] July 25, 2001, letter from Rebecca Weber of EPA Region VI to Bliss Higgins of LDEQ. "Motiva Enterprises, LLC, Low Sulfur Gasoline (LSG) Project – Related Emission Increase Methodology."

[9] February 28, 2005, letter from Sam Portanova of EPA Region V to Steve Dunn of WDNR. "Request for a PSD Applicability Determination for Murphy Oil, Superior, Inc.

exception relevant to permitting of this Project is regulation of greenhouse gases in the same manner as described under the current version of 40 CFR 52.21.

The resulting emission calculations for determining whether a major modification will occur under the PSD rules are consistent with the Utah state rules for nonattainment and maintenance pollutants for this Project. There are no existing emission units modified as part of the Project, and potential to emit is used to represent the emissions increase from new emission units per §52.21(a)(2)(iv)(*d*). The EPA recognizes in its PSD rules that non-modified existing units experiencing an emissions increase as a result of the project need to be considered in the overall emissions increase calculation. For non-modified emission units, EPA allows for calculating the emissions increase as the product of the potential increase in throughput due to the project and an emissions factor representative of "worst-case" operations. The "potential increase in utilization" approach is consistent with the 1980 NSR rules and has been maintained for existing emissions units in the existing rules through §52.21(b)(41)(ii)(*d*), which allows a PTE approach in lieu of future actual emissions.

3.2 Calculation of Emission Increases

Actual annual emission increases have been calculated based on estimated increases in firing rates or throughputs at each of the units described below. Tesoro has used conservative emission factors to estimate the incremental increase in actual emissions. Tesoro relied on historical actual emissions to estimate the increase in emissions where data are available and emission limits where applicable.

3.2.1 GHT Process Heater (F-701) & DDU Charge Heater (F-680)

The incremental emissions increase at the GHT Process Heater and the DDU Charge Heater are calculated using the same emission factors as the annual emission inventory as follows:

- NO_x emissions are calculated using stack test results in accordance with the facility's NO_x cap.
- SO_2 emissions are calculated using the regulatory limit for fuel gas H_2S content of 162 ppmvd.
- CO, PM, PM_{10}, $PM_{2.5}$, and VOC emissions are calculated using EPA's AP-42 emission factors.
- H_2SO_4 emissions are assumed to be 1.5% of total SO_2 emissions based on calculations prepared for TRI reporting. Emissions are estimated assuming 1% of the SO_2 is converted to

SO_3 and 100% of the SO_3 is converted to H_2SO_4, which is equivalent to a mass ratio of 1.5 based on the molecular weights of H_2SO_4 and SO_2.

- CO_2e emissions are calculated based on CO_2, CH_4, and N_2O emission factors from the EPA GHG Mandatory Reporting Rule, 40 CFR 98, Subpart C. Global warming potentials for CO_2, CH_4, and N_2O are from Table A-1 of 40 CFR 98.

3.2.2 Sulfur Recovery Unit (SRU)

The incremental emissions increase at the SRU is calculated based on an estimate of additional sulfur in the feed to the SRU as a result of the Project as follows:

- SO_2 emissions are calculated assuming full oxidation of the unrecovered sulfur. The SRU is required to recover at least 95% of the sulfur by Condition II.B.2.b.1. The Project is expected to be completed before the tail gas treatment unit (proposed as part of the Waxy Crude Processing Project) will be operational; therefore, emission reductions resulting from operations of the tail gas treatment unit have not been accounted for in the calculations.
- H_2SO_4 emissions are assumed to be 0.001% of the total SO_2 emissions based on calculations prepared for TRI reporting. Emissions are estimated assuming 1% of the SO_2 is converted to SO_3, and the conversion to H_2SO_4 is based on the equilibrium coefficient calculated at the stack temperature.
- CO_2e emissions are calculated based on CO_2, CH_4, and N_2O emission factors from the EPA GHG Mandatory Reporting Rule, 40 CFR 98, Subpart Y. Global warming potentials for CO_2, CH_4, and N_2O are from Table A-1 of 40 CFR 98.

3.2.3 Storage Tanks

The incremental emissions increases at Tanks 204, 212, 213, 246, and 247 are calculated using the TANKS 4.09d software. The estimated increase in throughput for jet kerosene is assumed to be distributed evenly to Tanks 246 and 247, and the estimated increase in distillate fuel oil #2 throughput is distributed to Tanks 204, 212, 213.

3.2.4 Loading Rack

The incremental VOC emissions increase at the loading rack is calculated based on the estimated increase in jet kerosene and distillate fuel oil #2 production. Loading loss emissions were calculated based on EPA's AP-42 methodology.

3.2.5 Process Fugitive Components

New fugitive components in VOC service will be installed as a result of the Project. The incremental emissions increase is calculated using and engineering estimate on the number of valves and "USEPA Protocol for Equipment Leak Emissions Estimates, November 1995". The final number of installed components will likely change from the initial estimate after additional detailed design/engineering is performed; however, the change is VOC emissions from this activity is not appreciable and will not change the NSR applicability determination.

The Project will not increase the probability of a relief event at an atmospheric relief valve. Therefore, no emissions from atmospheric relief valves are included in the Project emission calculations.

3.2.6 Emissions Increase Summary

Refer to Table 3-1 below for the emissions increase summary and to Sections 4.5 and 4.6 for determinations of applicability to NSR. As described above, NSR applicability is based on the increase in actual emissions from existing emission units and potential-to-emit for new emission units.

Applicability to certain provisions in the Utah air quality rules is based on the increase of potential (allowable) emissions, described within Section 4.0. The increase of allowable emissions includes only the emissions from new fugitive components (0.32 tpy VOC).

3.3 HAP Emissions

Actual annual HAP emission increases associated with the Project includes fuel gas combustion emissions, storage tank emissions, and loadout emissions. Table 3-2 below contains a summary of actual HAP emission increases. There are no increases in potential emissions of HAPs as a result of the Project. Refer to Attachment B for detailed HAP emission calculations.

Table 3-1. Project Actual Emission Increase Summary

Emission Unit	NO_X (tons/yr)	SO_2 (tons/yr)	CO (tons/yr)	PM (tons/yr)	PM_{10} (tons/yr)	$PM_{2.5}$ (tons/yr)	VOC (tons/yr)	H_2SO_4 (tons/yr)	CO_2e (tons/yr)
GHT Process Heater (F-701)	1.00	0.34	1.12	0.10	0.10	0.10	0.07	5.06×10^{-03}	1,786
DDU Charge Heater (F-680)	0.28	0.11	0.35	0.03	0.03	0.03	0.02	1.58×10^{-03}	559
SRU	---	8.55	---	---	---	---	---	1.15×10^{-04}	45
Storage Tanks	---	---	---	---	---	---	0.43	---	---
Loading Rack	---	---	---	---	---	---	1.16	---	---
Fugitive Components	---	---	---	---	---	---	0.32	---	---
Project Total:	**1.28**	**8.99**	**1.47**	**0.13**	**0.13**	**0.13**	**2.00**	**0.01**	**2,390**

Table 3-2. Project Actual HAP Emissions Summary

HAP	GHT Process Heater (F-701) (lb/yr)	DDU Charge Heater (F-680) (lb/yr)	Storage Tanks (lb/yr)	Loadout Rack (lb/yr)	Project Emissions Increase (lb/yr)
Benzene	5.59×10^{-02}	1.75×10^{-02}	---	---	**7.34×10^{-02}**
Biphenyl	---	---	0.59	1.60	**2.20**
Dichlorobenzene	3.19×10^{-02}	1.00×10^{-02}	---	---	**4.19×10^{-02}**
Ethylbenzene	---	---	0.14	0.38	**0.51**
Formaldehyde	2.00	0.62	---	---	**2.62**
Hexane	47.92	15.00	---	---	**62.92**
Naphthalene	---	---	1.98	5.37	**7.35**
Toluene	9.05×10^{-02}	2.83×10^{-02}	0.31	0.83	**1.26**
1,2,4-Trimethylbenzene	---	---	18.99	51.49	**70.49**
Xylene	---	---	48.68	131.96	**180.64**
POM	2.35×10^{-03}	7.35×10^{-04}	---	---	**3.08×10^{-03}**
Arsenic	5.32×10^{-03}	1.67×10^{-03}	---	---	**6.99×10^{-03}**
Beryllium	3.19×10^{-04}	1.00×10^{-04}	---	---	**4.19×10^{-04}**
Cadmium	2.93×10^{-02}	9.16×10^{-03}	---	---	**3.84×10^{-02}**
Chromium	3.73×10^{-02}	1.17×10^{-02}	---	---	**4.89×10^{-02}**
Cobalt	2.24×10^{-03}	7.00×10^{-04}	---	---	**2.94×10^{-03}**
Manganese	1.01×10^{-02}	3.17×10^{-03}	---	---	**1.33×10^{-02}**
Mercury	6.92×10^{-03}	2.17×10^{-03}	---	---	**9.09×10^{-03}**
Nickel	5.59×10^{-02}	1.75×10^{-02}	---	---	**7.34×10^{-02}**
Selenium	6.39×10^{-04}	2.00×10^{-04}	---	---	**8.39×10^{-04}**
Total HAPs					**328.30**

4.0 Regulatory Applicability and Compliance Demonstration

Tesoro has completed an applicability review of all Federal and State air quality regulations as part of the air permit application process. Table 4-1 provides a summary of the major air quality programs that were reviewed for the Project. Each regulation which requires explanation is described in the following sections. Certain aspects of the Project result in the triggering of new applicable requirements.

Table 4-1. Summary of Air Quality Regulatory Applicability for the Project

Report Section	Program Description	Regulatory Citation	Does This Project Trigger New Applicable Requirements?
---	National Ambient Air Quality Standards (NAAQS)	40 CFR 50	No
4.5, 4.6	New Source Review (NSR)	40 CFR 52	No
4.1	New Source Performance Standards (NSPS)	40 CFR 60	No
4.2	National Emission Standards for Hazardous Air Pollutants (NESHAPs)	40 CFR 61	No
4.2	NESHAPs for Source Categories	40 CFR 63	No
---	Risk Management Programs for Chemical Accidental Release Prevention	40 CFR 68	No
---	Title V Operating Permit	40 CFR 70	No
---	Acid Rain Requirements	40 CFR 72	No
---	Stratospheric Ozone Protection Requirements	40 CFR 82	No
---	**Utah State Rules**	**UAC R307**	---
4.1	Stationary Sources	R307-210	No
4.2	National Emission Standards for Hazardous Air Pollutants	R307-214	No
4.3	Ozone Nonattainment and Maintenance Areas: Control of Hydrocarbon Emissions in Petroleum Refineries	R307-326	No
---	Ozone Nonattainment and Maintenance Areas: Petroleum Liquid Storage	R307-327	No
4.4	Permit: New and Modified Sources	R307-401	Yes
4.5	Nonattainment and Maintenance Areas	R307-403	No
4.6	Permits: Major Sources in Attainment or Unclassified Areas (PSD)	R307-405	No

Report Section	Program Description	Regulatory Citation	Does This Project Trigger New Applicable Requirements?
4.7	Visibility	R307-406	No
4.8	Permits: Emissions Impact Analysis	R307-410	No
---	Permits: Fees for Approval Orders	R307-414	No
4.9	Permits: Ozone Offset Requirements in Davis and Salt Lake Counties	R307-420	No
4.10	Permits: PM_{10} Offset Requirements in Salt Lake County and Utah County	R307-421	No
4.11	Consent Decree - United States, et.al. v. BP Exploration & Oil, et. al., Civil Action No. 2:96 CV 095 RL	---	No

4.1 R307-210: Stationary Sources

New Source Performance Standards (NSPS) are incorporated by reference into the UDAQ rules. There is no new construction of any NSPS affected facilities. Tesoro reviewed whether the Project will result in a "modification" or "reconstruction" for any NSPS affected facilities, and thus result in applicability of that NSPS. The NSPS regulation, at 40 CFR §60.14(a), defines a modification as a physical or operational change to the affected facility that is not specifically exempted and that results in an increase in the emissions rate to the atmosphere of any pollutant to which a standard applies. An increase in production rate, if that increase can be accomplished without a capital expenditure on that facility, is not considered a modification per §60.14(e)(2). "Increase in emissions rate" is defined pursuant to §60.14(b) as an increase in the maximum hourly emission rate of an applicable pollutant from the affected facility. A reconstruction occurs when the fixed capital cost of the project is 50 percent or greater than the current replacement cost of the affected facility.

The physical changes performed as part of the GHT conversion to KHT service affect only the existing GHT process and piping to storage tanks. Applicability to 40 CFR 60 Subparts Kb and GGGa are discussed below in additional detail.

Regulatory coverage for other NSPS subparts currently applicable to the facility are as follows: 40 CFR 60 Subparts A, Db, J, Ja, K, Ka, GG, GGG, NNN, and QQQ. These are listed in Section III of the AO and will not change as a result of this Project.

4.1.1 Subpart Kb: Standards of Performance for Volatile Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984

Subpart Kb regulates storage vessels with a capacity greater than or equal to 75 m^3 that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 23, 1984, with exceptions based on the maximum true vapor pressure of the stored liquid.[10] A storage vessel is defined as:[11]

> "Storage vessel *means each tank, reservoir, or container used for the storage of volatile organic liquids but does not include:*
>
> *(1) Frames, housing, auxiliary supports, or other components that are not directly involved in the containment of liquids or vapors;*
>
> *(2) Subsurface caverns or porous rock reservoirs; or*
>
> *(3) Process tanks."*

The proposed changes as part of the GHT conversion to KHT affect only piping to the existing storage tanks, which are not directly involved in the containment of liquids. Therefore, the Project does not include changes to any affected facility as defined under Subpart Kb. Therefore, no modifications or reconstructions will occur as a result of the Project.

4.1.2 Subpart GGGa: Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After November 7, 2006

Subpart GGGa regulates equipment leaks from the group of all the equipment in VOC service within a process unit that are constructed, reconstructed, or modified after November 7, 2006. Equipment in VOC service at the Salt City Refinery are subject to NSPS Subpart VV pursuant to 40 CFR 63 Subpart CC. The overlap conditions in at 40 CFR 63.140(p) state the following:

> *"(p) Overlap of subpart CC with other regulations for equipment leaks. After the compliance dates specified in paragraph (h) of this section equipment leaks that are also subject to the provisions of 40 CFR parts 60 and 61 are required to comply only with the provisions specified in this subpart."*

This condition may be interpreted that the process units which will have components added or replaced as a result of the Project, which contain components in organic HAP service, cannot be

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[10] 40 CFR 60.110b

[11] 40 CFR 60.111b

subject to Subpart GGGa regardless of changes made in the units. Due to the current uncertainty in applying this overlap provision to regulatory applicability under Subpart GGGa, Tesoro has considered applicability of Subpart GGGa under the modification provisions under §60.14, which require that the physical change results in an emissions increase at the affected facility, which is calculated at maximum capacity before and after the change. The affected facility in this case is the sum of all equipment (components) at each of the affected process units. Additionally, the addition or replacement of equipment for the purpose of process improvement which is accomplished without a capital expenditure shall not by itself be considered a modification under this subpart per §60.590a(c).

While exact component counts on a unit by unit basis are not currently available, the total number of components added is not expected to result in a modification because Tesoro does not expect a capital expenditure to occur as part of the Project. Tesoro will review this assumption when detailed drawings are made available. In the event that modification is triggered under Subpart GGGa, Tesoro will provide updated information to UDAQ.

4.2 R307-214: National Emission Standards for Hazardous Air Pollutants

NESHAP standards from 40 CFR 61 and 40 CFR 63 are incorporated by reference into the UDAQ rules. The physical changes performed as part of the GHT conversion to KHT affect only the GHT process and piping to storage tanks. The refinery is currently subject to 40 CFR 63 Subpart CC for "National Emission Standards for Hazardous Air Pollutants from Petroleum Refineries." Storage vessels and equipment leaks are regulated as emission points under this subpart. Tesoro will continue to comply with the emission standards and other requirements of this rule. No new requirements will be triggered as a result of this Project.

Regulatory coverage for other subparts currently applicable to the facility (40 CFR 61 Subparts A, M, and FF and 40 CFR 63 Subparts UUU, EEEE, and DDDDD as listed in Section III of the AO) will not change as a result of this Project.

4.3 R307-326: Ozone Nonattainment and Maintenance Areas: Control of Hydrocarbon Emissions in Petroleum Refineries

Rule R307-326 requires control of various VOC sources at petroleum refineries. Tesoro will comply with the provisions of this rule as it relates to this Project by monitoring leaks from existing, new, and replacement fugitive components in accordance with R307-326-9.

4.4 R307-401: Permit: New and Modified Sources

Rule R307-401-3(b) requires submittal of an NOI to "make modifications or relocate an existing installation which will or might reasonably expected to increase the amount or change the effect of, or the character of, air contaminants discharged, so that such installation may be expected to become a source or indirect source of air pollution." The Project may increase the amount of air contaminants discharged from multiple emission units. Rule R307-401-5 requires submittal of an NOI, which must contain specific information related to the process, nature of emissions, control device(s), and regulatory applicability and compliance. Refer to Section 5.0 for a summary of compliance with the NOI requirements.

4.4.1 BACT

Rule 307-401-5(d) permits the issuance of an approval order if it is determined that the pollution control for emissions is at least best available control technology (BACT). Tesoro understands that a BACT review is required for new emission units and existing emission units where there is a physical modification and an increase in emissions. A BACT review is therefore required for the new components added as part of the Project. BACT does not apply to the non-modified emission units affected by the Project (GHT Process Heater F-701, DDU Charge Heater F-680, SRU, storage tanks, or loading rack).

The addition of the new components will result in increases of VOC emissions due to equipment leaks. Tesoro is required to comply with a Consent Decree, which requires quarterly monitoring of all valves in VOC service (with no decreasing frequency) and a leak definition of 500 ppm. Pumps must also be monitored on a monthly basis with an initial leak definition of 2,000 ppm. Tesoro believes the best control, taking into account energy, environmental, and economic costs, is compliance with the Consent Decree.

4.5 R307-403: Nonattainment and Maintenance Areas

R307-403 applies to major new sources or major modifications to be located in a nonattainment area. The refinery is located in a nonattainment area for $PM_{2.5}$ (including precursor SO_2)[12], PM_{10} (including precursors SO_2 and NO_x)[13], and SO_2. The area is also a designated maintenance area for ozone (VOC

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[12] 40 CFR 51, Appendix S, II.A.31, in effect until a $PM_{2.5}$ State Implementation Plan for the air quality control region is finalized.

[13] Utah PM_{10} Maintenance Provisions for Salt Lake County, Section IX.A.10, July 6, 2005.

and NO_x) and CO. The proposed Project is neither a new major source nor a major modification as defined in R307-101-2 since the actual emissions increase is less than the significant emission rate (SER) thresholds. Refer to Table 4-2 for a summary of this calculation.

Table 4-2. Project Major Modification Applicability under R307-403

Pollutant	Emission Increase (tons/yr)	Significant Emission Rate (SER) (tons/yr)	Percentage of SER (%)
NO_x	1.28	40	3.2%
SO_2	8.99	40	22.5%
CO	1.47	100	1.5%
PM_{10}	0.13	15	0.9%
$PM_{2.5}$	0.13	10	1.3%
VOC	2.00	40	5.0%

Emission offsets are required if the combined allowable emission increase of PM_{10}, SO_2, and NO_x exceeds 25 tons per year per R307-403-5. As indicated in Section 3.2.6, the combined allowable emission increase from the Project is 0 tons per year of these pollutants. Therefore, no emission offsets are required.

4.6 R307-405: Permits: Major Sources in Attainment or Unclassified Areas (PSD)

R307-405 applies to major new sources or major modifications located in an attainment, unclassified, and maintenance areas. This rule requires review of all regulated NSR pollutants except those pollutants in nonattainment with the ambient air quality standards ($PM_{2.5}$, PM_{10}, and SO_2). The proposed Project is neither a new major source nor a major modification as defined in R307-405-3 since the emissions increase is less than the SER thresholds. Refer to Table 4-3 for a summary of this calculation. Tesoro has demonstrated compliance with all applicable requirements with the submission of this NOI. Therefore the requirements of R307-405 are not applicable to this proposed Project.

Table 4-3. Project Major Modification Applicability under R307-405

Pollutant	Emission Increase (tons/yr)	Significant Emission Rate (SER) (tons/yr)	Percentage of SER (%)
NO_x	1.28	40	3.2%
CO	1.47	100	1.5%
PM	0.13	25	0.5%
VOC	2.00	40	5.0%
H_2SO_4	0.01	7	0.1%
CO_2e	2,390	75,000	3.2%

The federal PSD rules define when an owner/operator of a major source is required to perform recordkeeping and reporting after using the actual emission increase calculation methodology. If a facility uses this emission increase test and determines that review is not required, certain recordkeeping and reporting provisions are required if there is a "reasonable possibility" that the emissions increase from the project will exceed the federal NSR significant emission rates.[14] A "reasonable possibility" occurs when the projected increase in emissions equals or exceeds 50 percent of the NSR SERs for any pollutant. In other words, if the emission calculation demonstrates that the expected increase in emissions is greater 50 percent the SERs, then the facility must keep the required records to verify that the significant emissions rates are not exceeded. As demonstrated in Table 4-1 above, the increase in emissions from this proposed Project is not greater than 50% of the SERs for any of the applicable pollutants. Therefore, post-Project actual annual emissions recordkeeping is not required.

4.7 R307-406: Visibility

R307-406 applies to major new sources or major modifications. This Project is not a new major source or a major modification; therefore the provisions of this rule are not applicable.

4.8 R307-410: Permits: Emissions Impact Analysis

R307-410 establishes the procedures and requirements for evaluating the emissions impact of new or modified sources. Pursuant to R307-410-4, dispersion modeling is required for increases in the total

[14] 40 CFR 52.21(r)(6)

controlled emission rate of attainment pollutants (NO_x and CO for the SLC refinery) in an amount greater or equal to values given in Table 1 of the rule. For these pollutants, the thresholds given in Table 1 are equal to the SERs. Dispersion modeling is not required since the increases in emissions of NO_x and CO are less than the SERs.

The requirements of R307-410-5 for documentation of ambient air impacts for hazardous air pollutants do not apply to installations which are subject to or are scheduled to be subject to an emission standard promulgated under 42 USC 7412 at the time the NOI is submitted. As described in Section 4.2, the existing tankage and new components are subject to 40 CFR 63 Subpart CC; therefore, the requirements of R307-410-5 do not apply to the Project. For informational purposes, Table 3-2 above presents the actual HAP emissions increase as a result of the Project.

4.9 R307-420: Permits: Ozone Offset Requirements in Davis and Salt Lake Counties

The SLC Refinery is located in a maintenance area for ozone. Emission offsets are required for any new major source or major modification of VOC or NO_x. R307-420-2 defines a significant emission increase at a level of 25 tpy VOC rather than 40 tpy VOC. The Project is neither a new major source nor a major modification for VOC (considering the lower threshold) or NO_x; therefore, offsets are not required.

4.10 R307-421: Permits: PM_{10} Offset Requirements in Salt Lake County and Utah County

Emission offsets are required if the combined allowable emission increase of SO_2 and NO_x exceeds 25 tons per year. The combined allowable emission increase of these pollutants from the Project is 0 tons per year per Section 3.2.6. Therefore, no emission offsets are required.

4.11 Consent Decree - United States, et.al. v. BP Exploration & Oil, et. al., Civil Action No. 2:96 CV 095 RL

On August 29, 2001 BP Exploration entered into a Consent Decree with the US EPA covering eight refineries including the Salt Lake City and Mandan refineries. When Tesoro purchased the Salt Lake and Mandan refineries from BP, Tesoro assumed responsibility for the provisions of the consent decree as they related to the two facilities. This Project is not being undertaken to comply with any provisions of the consent decree. Tesoro will continue to comply with the provisions of the consent decree after implementation of the Project.

5.0 Summary of NOI Requirements for Project

Table 5-1 provides a summary of how this NOI complies with the specific requirements of Rule R307-401-5(2).

Table 5-1. Summary of NOI Requirements

Requirement	Section Reference for Information Provided
(a) A description of the nature of the processes involved; the nature, procedures for handling and quantities of raw materials; the type and quantity of fuels employed; and the nature and quantity of finished product.	Section 2.2
(b) Expected composition and physical characteristics of effluent stream both before and after treatment by any control apparatus, including emission rates, volume, temperature, air contaminant types, and concentration of air contaminants.	Section 3.2, 3.3
(c) Size, type and performance characteristics of any control apparatus.	N/A
(d) An analysis of best available control technology for the proposed source or modification. When determining best available control technology for a new or modified source in an ozone nonattainment or maintenance area that will emit volatile organic compounds or nitrogen oxides, the owner or operator of the source shall consider EPA Control Technique Guidance (CTG) documents and Alternative Control Technique documents that are applicable to the source. Best available control technology shall be at least as stringent as any published CTG that is applicable to the source.	Section 4.4.1
(e) Location and elevation of the emission point and other factors relating to dispersion and diffusion of the air contaminant in relation to nearby structures and window openings, and other information necessary to appraise the possible effects of the effluent.	Attachment A – location provided – other info not needed since modeling is not required.
(f) The location of planned sampling points and the tests of the completed installation to be made by the owner or operator when necessary to ascertain compliance.	Not applicable – no new testing is necessary to demonstrate compliance.
(g) The typical operating schedule.	Section 2.2

Requirement	Section Reference for Information Provided
(h) A schedule for construction.	Section 2.5
(i) Any plans, specifications and related information that are in final form at the time of submission of notice of intent.	No plans or specifications are in final form at the time of this submission.
(j) Any additional information required by:	
(i) R307-403, Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas;	(i) Section 4.5
(ii) R307-405, Permits: Major Sources in Attainment or Unclassified Areas (PSD);	(ii) Section 4.6
(iii) R307-406, Visibility;	(iii) Section 4.7
(iv) R307-410, Emissions Impact Analysis;	(iv) Section 4.8
(v) R307-420, Permits: Ozone Offset Requirements in Davis and Salt Lake Counties;	(v) Section 4.9
(vi) R307-421, Permits: PM10 Offset Requirements in Salt Lake County and Utah County.	(vi) Section 4.10
(k) Any other information necessary to determine if the proposed source or modification will be in compliance with Title R307.	Section 4.1 (NSPS Compliance) Section 4.2 (MACT Compliance) Section 4.3 (Control of Hydrocarbons)

Attachment A

Site Diagram

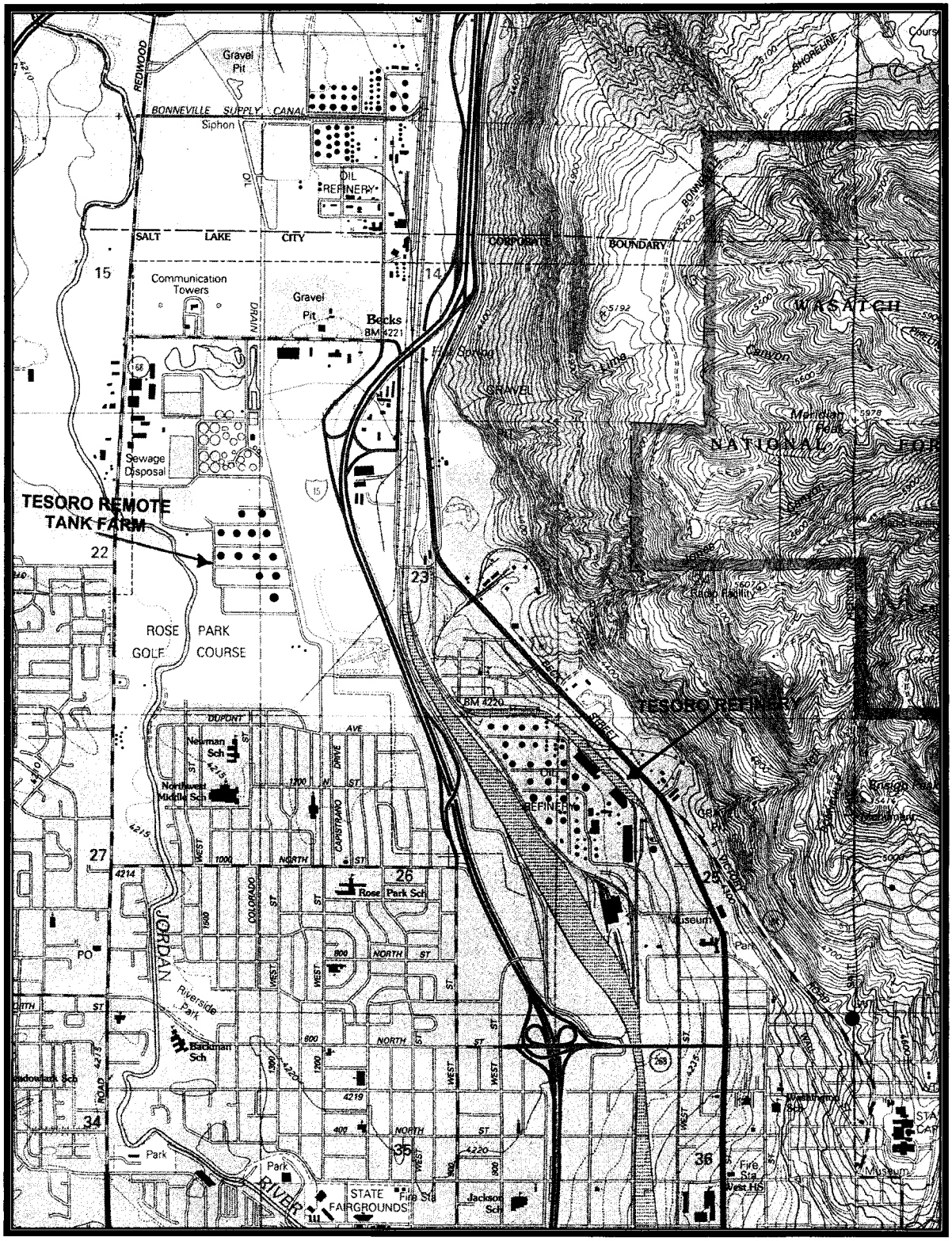

Figure A-1
Refinery Location Map

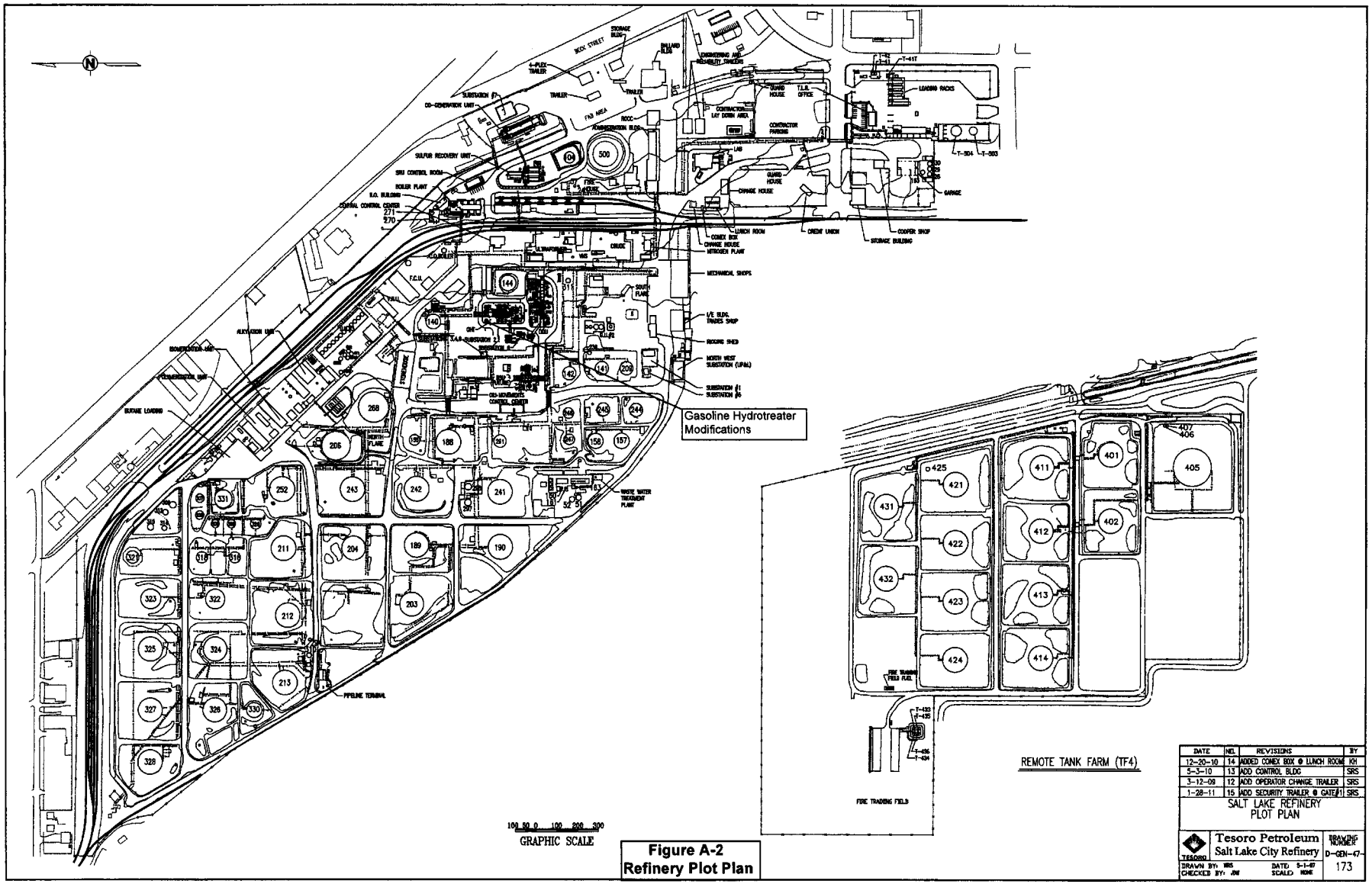

Figure A-2
Refinery Plot Plan

Attachment B

Emission Calculations for Project

Attachment B-1
Projected Actual Emission Calculations for GHT Process Heater (F-701)

Quantity	Value	Units	Reference
Projected Firing Rate:	2.86	Mscf/hr	Calculated
Fuel Heat Content:	1083.8	Btu/scf	Engineering estimate
Fuel Use Requirement:	3.1	MMBtu/hr	Engineering estimate
Fuel H_2S Content:	162	ppmvd	NSPS J limit
Hours of Operation:	8760	hr/yr	

Pollutant	Emission Factor	Units	Projected Emissions (lb/hr) [1]	Projected Emissions (tpy) [2]	Emission Factor Reference
NO_X	0.074	lb/MMBtu	0.23	1.00	4/1/09 Stack Test Results
SO_2	26.91	lb/MMscf	7.70E-02	0.34	Calculated
CO	8.24E-02	lb/MMBtu	0.26	1.12	AP-42 Table 1.4-1
PM	7.45E-03	lb/MMBtu	2.31E-02	0.10	AP-42 Table 1.4-2
PM_{10}	7.45E-03	lb/MMBtu	2.31E-02	0.10	AP-42 Table 1.4-2
$PM_{2.5}$	7.45E-03	lb/MMBtu	2.31E-02	0.10	AP-42 Table 1.4-2
VOC	5.39E-03	lb/MMBtu	1.67E-02	7.32E-02	AP-42 Table 1.4-2
H_2SO_4	0.40	lb/MMscf	1.15E-03	5.06E-03	TRI calculation (1.5% of SO2 emissions)
CO_2 [3]	142,000	lb/MMscf	406.16	1,779.00	2008-2011 Monitoring
CH_4 [4]	7.17	lb/MMscf	2.05E-02	8.98E-02	40 CFR 98 Subpart C
N_2O [5]	1.43	lb/MMscf	4.10E-03	1.80E-02	40 CFR 98 Subpart C
CO_2e [6]	142,595	lb/MMscf	407.87	1,786.45	40 CFR 98 Subpart A

[1] Projected Emissions (lb/hr) = Emission Factor (lb/MMBtu) x Projected Firing Rate (MMBtu/hr) or
Projected Emissions (lb/hr) = Emission Factor (lb/MMscf) x Projected Firing Rate (Mscf/hr) / 1000 Mscf/MMscf
[2] Projected Emissions (tpy) = Projected Emissions (lb/hr) x Hours of Operation (hr/yr) / 2000 lb/ton
[3] Emission Factor calculated from 2008-2011 monitoring data per Equation C-5 of 40 CFR 98
[4] Emission Factor = 0.003 kg/MMBtu * HHV * 2.2 lb/kg per Equation C-8 of 40 CFR 98
[5] Emission Factor = 0.0006 kg/MMBtu * HHV * 2.2 lb/kg per Equation C-8 of 40 CFR 98
[6] Global Warming Potentials of 1 for CO_2, 21 for CH_4, and 310 for N_2O per Table A-1 of 40 CFR 98

Attachment B-2
Projected Actual Emission Calculations for DDU Charge Heater (F-680)

Quantity	Value	Units	Reference
Projected Firing Rate:	0.89	Mscf/hr	Calculated
Fuel Heat Content:	1083.8	Btu/scf	Engineering estimate
Fuel Use Requirement:	0.97	MMBtu/hr	Engineering estimate
Fuel H_2S Content:	162	ppmvd	Engineering estimate
Hours of Operation:	8760	hr/yr	

Pollutant	Emission Factor	Units	Projected Emissions (lb/hr) [1]	Projected Emissions (tpy) [2]	Emission Factor Reference
NO_X	0.065	lb/MMBtu	6.31E-02	0.28	5/30/08 Stack Test Results
SO_2	26.91	lb/MMscf	2.41E-02	0.11	Calculated
CO	8.24E-02	lb/MMBtu	7.99E-02	0.35	AP-42 Table 1.4-1
PM	7.45E-03	lb/MMBtu	7.23E-03	3.17E-02	AP-42 Table 1.4-2
PM_{10}	7.45E-03	lb/MMBtu	7.23E-03	3.17E-02	AP-42 Table 1.4-2
$PM_{2.5}$	7.45E-03	lb/MMBtu	7.23E-03	3.17E-02	AP-42 Table 1.4-2
VOC	5.39E-03	lb/MMBtu	5.23E-03	2.29E-02	AP-42 Table 1.4-2
H_2SO_4	0.40	lb/MMscf	3.61E-04	1.58E-03	TRI calculation (1.5% of SO2 emissions)
CO_2 [3]	142,000	lb/MMscf	127.09	556.65	2008-2011 Monitoring
CH_4 [4]	7.17	lb/MMscf	6.42E-03	2.81E-02	40 CFR 98 Subpart C
N_2O [5]	1.43	lb/MMscf	1.28E-03	5.62E-03	40 CFR 98 Subpart C
CO_2e [6]	142,595	lb/MMscf	127.62	558.99	40 CFR 98 Subpart A

[1] Projected Emissions (lb/hr) = Emission Factor (lb/MMBtu) x Projected Firing Rate (MMBtu/hr) or
Projected Emissions (lb/hr) = Emission Factor (lb/MMscf) x Projected Firing Rate (Mscf/hr) / 1000 Mscf/MMscf
[2] Projected Emissions (tpy) = Projected Emissions (lb/hr) x Hours of Operation (hr/yr) / 2000 lb/ton
[3] Emission Factor calculated from 2008-2011 monitoring data per Equation C-5 of 40 CFR 98
[4] Emission Factor = 0.003 kg/MMBtu * HHV * 2.2 lb/kg per Equation C-8 of 40 CFR 98
[5] Emission Factor = 0.0006 kg/MMBtu * HHV * 2.2 lb/kg per Equation C-8 of 40 CFR 98
[6] Global Warming Potentials of 1 for CO_2, 21 for CH_4, and 310 for N_2O per Table A-1 of 40 CFR 98

Attachment B-3
Projected Stack HAP Emission Calculations for Fuel Gas Combustion

HAP	Emission Factor [A] (lb/MMBtu)	GHT Process Heater (F-701) (lb/yr)	DDU Charge Heater (F-680) (lb/yr)	Total HAP Emissions (lb/yr)
Benzene	2.06E-06	5.59E-02	1.75E-02	7.34E-02
Dichlorobenzene	1.18E-06	3.19E-02	1.00E-02	4.19E-02
Formaldehyde	7.35E-05	2.00	0.62	2.62
Hexane	1.76E-03	47.92	15.00	62.92
Napthalene	5.98E-07	1.62E-02	5.08E-03	2.13E-02
Toluene	3.33E-06	9.05E-02	2.83E-02	0.12
POM	8.65E-08	2.35E-03	7.35E-04	3.08E-03
Arsenic	1.96E-07	5.32E-03	1.67E-03	6.99E-03
Beryllium	1.18E-08	3.19E-04	1.00E-04	4.19E-04
Cadmium	1.08E-06	2.93E-02	9.16E-03	3.84E-02
Chromium	1.37E-06	3.73E-02	1.17E-02	4.89E-02
Cobalt	8.24E-08	2.24E-03	7.00E-04	2.94E-03
Manganese	3.73E-07	1.01E-02	3.17E-03	1.33E-02
Mercury	2.55E-07	6.92E-03	2.17E-03	9.09E-03
Nickel	2.06E-06	5.59E-02	1.75E-02	7.34E-02
Selenium	2.35E-08	6.39E-04	2.00E-04	8.39E-04

A Source: AP-42, 5th Edition, Section 1.4, Natural Gas Combustion, Tables 1.4-3 and 1.4-4, 7/98

Attachment B-4
Stack Emission Calculations for SRU

Quantity	Value	Units	Reference
Additional sulfur in feed:	338.6	lb/day	Estimate from DDU
Additional sulfur in feed:	130	lb/day	Estimate from GHT
	85.51	ton/yr	Total increase
Recovery:	95%		Permit condition II.B.2.b.1
Sulfur Emissions:	4.28	ton/yr	Calculated using recovery
SO_2 Emissions:	8.55	ton/yr	Calculated by molecular weight
Additional sour gas flow:	3,924,150	scf/yr	Engineering estimate
Hours of Operation:	8760	hr/yr	

Pollutant	Emission Increase (lb/hr) [1]	Emission Increase (tpy)	Reference
SO_2	1.95	8.55	Calculated
H_2SO_4	2.62E-05	1.15E-04	TRI calculation (0.001% of SO_2 emissions)
CO_2 [2]	10.23	44.81	40 CFR 98 Subpart Y
CO_2e [3]	10.23	44.81	40 CFR 98 Subpart A

[1] Emission Increase (lb/hr) = Emission Increase (tpy) / Hours of Operation (hr/yr) * 2000 lb/ton

[2] Emission Increase of SO_2 based on Equation Y-12 of 40 CFR 98 (assumed carbon content = 0.2)

[3] Global Warming Potential of 1 for CO_2 per Table A-1 of 40 CFR 98

Note: There are no emission increases of HAPs associated with the SRU.

Attachment B-5
Projected Actual Emissions Calculations from Tanks and Loadout

		Projected Emissions Increase								
		1,2,4-Trimethylbenzene	Ethylbenzene	Biphenyl	Naphthalene	Toluene	Xylene	Total HAP	Total VOC	
Emission Unit	Stored Material	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	lb/yr	tpy
Tank 204	Distillate Fuel Oil #2	5.34		0.02	0.37		15.53	21.27	226.70	0.11
Tank 212	Distillate Fuel Oil #2	5.34		0.02	0.37		15.53	21.27	226.70	0.11
Tank 213	Distillate Fuel Oil #2	5.34		0.02	0.37		15.53	21.27	226.70	0.11
Tank 246	Jet Kerosene	1.48	0.07	0.26	0.44	0.15	1.04	3.45	86.74	0.04
Tank 247	Jet Kerosene	1.48	0.07	0.26	0.44	0.15	1.04	3.45	86.74	0.04
Total Tanks		18.99	0.14	0.59	1.98	0.31	48.68	70.69	853.58	0.43
Total Loadout [1]		51.49	0.38	1.60	5.37	0.83	131.96	191.63	2313.89	1.16

[1] HAP emissions are calculated based on a ratio of Tanks VOC to Loadout VOC

Attachment B-6
Emission Calculations for Distillate Fuel Oil #2 and Jet Kerosene Loadout Increases

Distillate Fuel Oil #2 Loadout

Increase in Distillate Fuel Oil #2 throughput: 35,674 1,000-gal/year

Pre-Vapor Collection and Processing System Leakage Loss
Emissions calculated using the AP-42 equation for loading petroleum liquid,
Eq. 1, Chapter 5, Section 2, January 1995.
Vapor pressure, molecular weight, and temperature based on AP-42 Table 7.1-2

LL = 12.46 * S * P * M / T

Where:

S = Saturation factor from Table 5.2-1:	1	dimensionless
P = True vapor pressure of liquid loaded:	0.0081	psia
M = Molecular weight of vapors:	130	lb/lb-mole
T = Temperature of bulk liquid loaded:	526	°R
LL = Loading loss for liquid loaded:	0.0249	lb-VOC/1,000-gal
EF Leakage Loss:	0.0249	lb-VOC/1,000-gal

Total
Calculated VOC emission increase: 0.44 tpy VOC

No GHG emissions calculated from loadout since vapor-phase methane concentration is less than 0.5 volume percent per 40 CFR 98.253(n).

Attachment B-6
Emission Calculations for Distillate Fuel Oil #2 and Jet Kerosene Loadout Increases

Jet Kerosene Loadout

Increase in Jet Kerosene throughput: 36,792 1,000-gal/year

Pre-Vapor Collection and Processing System Leakage Loss
Emissions calculated using the AP-42 equation for loading petroleum liquid,
Eq. 1, Chapter 5, Section 2, January 1995.
Vapor pressure, molecular weight, and temperature based on AP-42 Table 7.1-2

LL = 12.46 * S * P * M / T

Where:

S = Saturation factor from Table 5.2-1:	1	dimensionless
P = True vapor pressure of liquid loaded:	0.0128	psia
M = Molecular weight of vapors:	130	lb/lb-mole
T = Temperature of bulk liquid loaded:	534	°R
LL = Loading loss for liquid loaded:	0.0387	lb-VOC/1,000-gal
EF Leakage Loss:	0.0387	lb-VOC/1,000-gal

Total
Calculated VOC emission increase: 0.71 tpy VOC

No GHG emissions calculated from loadout since vapor-phase methane concentration is less than 0.5 volume percent per 40 CFR 98.253(n).

Total Loadout increase: 1.16 tpy VOC

Attachment B-7
Potential Emission Calculations from Equipment Leaks

Components (service)	New Count	Emission Factor[1] (kg/hr/source)	Emission Factor[1] (lb/hr/source)	Control Effectiveness[2] (%)	Emissions (lbs/yr)	Emissions (Tons/yr)
Valves (gas)	5	0.0268	0.059	96	104	0.05
Valves (LL)	0	0.0109	0.024	95	-	-
Valves (HL)	15	0.00023	0.0005	0	67	0.03
Flanges (gas)	12	0.00025	0.0006	81	11	0.01
Flanges (LL)	0	0.00025	0.0006	81	-	-
Flanges (HL)	55	0.00025	0.0006	81	50	0.03
Pump Seals (LL)	0	0.114	0.25	88	-	-
Pump Seals LL (Tandem)	0	0.114	0.25	100	-	-
Pump Seal (HL)	1	0.021	0.046	0	406	0.20
Comp. Seals (gas)	0	0.636	1.4	100	-	-
Comp. Seals (H_2)	0	0.636	1.402	100	-	-
Process Drains (total)	1	0.073	0.161	100	-	-
Relief Valves (gas)	0	0.16	0.35	100	-	-
Total	89				637	0.32

Gas = material in a gaseous state at operating conditions
LL = light liquid = material in a liquid state in which the sum of the concentration of individual constituents with a vapor pressure over 0.3 kilopascals (kPa) at 20 °C is greater than or equal to 20 weight percent.
HL = heavy liquid = not in gas/vapor service or light liquid service.

Notes:

1. Protocol for Equipment Leak Emission Estimates, November 1995, Table 2-2. Refinery Average Emission Factors.
2. Protocol for Equipment Leak Emission Estimates, November 1995, Table 5-3. Control Effectiveness for an LDAR Program at a Refinery Process Unit. Monitored under the Consent Decree leak definition of 500 pppm, quarterly with no chance for skip monitoring. Equivalent to HON regulation.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	204
City:	Salt Lake City
State:	Utah
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	LS2

Tank Dimensions

Shell Height (ft):		30.00
Diameter (ft):		114.50
Liquid Height (ft) :		30.00
Avg. Liquid Height (ft):		13.00
Volume (gallons):		2,309,000.00
Turnovers:		5.15
Net Throughput(gal/yr):		11,891,395.83
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		3.60
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

204 - Vertical Fixed Roof Tank
Salt Lake City, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jan	42.19	38.38	46.01	51.98	0.0034	0.0031	0.0039	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Feb	45.35	40.84	49.87	51.98	0.0038	0.0032	0.0045	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Mar	49.25	43.96	54.55	51.98	0.0044	0.0037	0.0054	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Apr	53.24	46.98	59.49	51.98	0.0051	0.0041	0.0064	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	May	57.74	50.54	64.93	51.98	0.0060	0.0046	0.0077	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Jun	62.65	54.94	70.36	51.98	0.0072	0.0055	0.0091	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Jul	66.53	58.63	74.43	51.98	0.0081	0.0062	0.0103	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Aug	65.15	57.72	72.57	51.98	0.0078	0.0060	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Sep	59.98	52.93	67.04	51.98	0.0065	0.0051	0.0083	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Oct	54.07	48.01	60.13	51.98	0.0053	0.0042	0.0065	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Nov	48.04	43.61	52.46	51.98	0.0042	0.0036	0.0050	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Dec	42.89	39.34	46.44	51.98	0.0035	0.0031	0.0040	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

204 - Vertical Fixed Roof Tank
Salt Lake City, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	14.5016	17.3226	25.2712	33.2777	45.6821	55.0412	65.1436	58.9591	46.1468	34.2948	19.7510	13.8585
Vapor Space Volume (cu ft):	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Space Expansion Factor:	0.0305	0.0359	0.0418	0.0489	0.0559	0.0593	0.0604	0.0569	0.0545	0.0473	0.0350	0.0283
Vented Vapor Saturation Factor:	0.9967	0.9963	0.9958	0.9951	0.9942	0.9931	0.9922	0.9925	0.9938	0.9949	0.9959	0.9966
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459	187,401.1459
Tank Diameter (ft):	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000
Vapor Space Outage (ft):	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000
Tank Shell Height (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Average Liquid Height (ft):	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000	13.0000
Roof Outage (ft):	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000
Roof Outage (Cone Roof)												
Roof Outage (ft):	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000	1.2000
Roof Height (ft):	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000	3.6000
Roof Slope (ft/ft):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Shell Radius (ft):	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500	57.2500
Vapor Density												
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Daily Avg. Liquid Surface Temp. (deg. R):	501.8630	505.0233	508.9222	512.9051	517.4062	522.3207	526.2015	524.8172	519.6544	513.7415	507.7078	502.5640
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0305	0.0359	0.0418	0.0489	0.0559	0.0593	0.0604	0.0569	0.0545	0.0473	0.0350	0.0283
Daily Vapor Temperature Range (deg. R):	15.2493	18.0717	21.1784	25.0031	28.7750	30.8446	31.5898	29.7004	28.2084	24.2312	17.7078	14.2011
Daily Vapor Pressure Range (psia):	0.0008	0.0013	0.0018	0.0023	0.0031	0.0036	0.0041	0.0037	0.0032	0.0023	0.0014	0.0009
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0031	0.0032	0.0037	0.0041	0.0046	0.0055	0.0062	0.0060	0.0051	0.0042	0.0036	0.0031
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0039	0.0045	0.0054	0.0064	0.0077	0.0091	0.0103	0.0098	0.0083	0.0065	0.0050	0.0040
Daily Avg. Liquid Surface Temp. (deg R):	501.8630	505.0233	508.9222	512.9051	517.4062	522.3207	526.2015	524.8172	519.6544	513.7415	507.7078	502.5640
Daily Min. Liquid Surface Temp. (deg R):	498.0506	500.5054	503.6276	506.6543	510.2125	514.6095	518.3040	517.3921	512.6023	507.6837	503.2808	499.0138
Daily Max. Liquid Surface Temp. (deg R):	505.6753	509.5412	514.2168	519.1559	524.5999	530.0318	534.0989	532.2423	526.7065	519.7993	512.1348	506.1143
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9967	0.9963	0.9958	0.9951	0.9942	0.9931	0.9922	0.9925	0.9938	0.9949	0.9959	0.9966
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035

Vapor Space Outage (ft):	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000	18.2000
Working Losses (lb):	3.0761	3.4756	20.2764	23.7442	27.8971	33.0428	37.5185	35.9220	29.9713	4.7981	3.8149	3.1647
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Net Throughput (gal/mo.):	291,695.8300	291,695.8300	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	291,695.8300	291,695.8300	291,695.8300
Annual Turnovers:	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500	5.1500
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000	2,309,000.0000
Maximum Liquid Height (ft):	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000	30.0000
Tank Diameter (ft):	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000	114.5000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	17.5777	20.7981	45.5476	57.0219	73.5792	88.0840	102.6621	94.8811	76.1181	39.0929	23.5659	17.0232

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

204 - Vertical Fixed Roof Tank
Salt Lake City, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	226.70	429.25	655.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	212
City:	Salt Lake City
State:	Utah
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	LS2

Tank Dimensions

Shell Height (ft):	29.50
Diameter (ft):	117.00
Liquid Height (ft) :	27.00
Avg. Liquid Height (ft):	12.00
Volume (gallons):	2,378,000.00
Turnovers:	5.00
Net Throughput(gal/yr):	11,891,395.83
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	3.70
Slope (ft/ft) (Cone Roof)	0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

212 - Vertical Fixed Roof Tank
Salt Lake City, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jan	42.19	38.38	46.01	51.98	0.0034	0.0031	0.0039	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Feb	45.35	40.84	49.87	51.98	0.0038	0.0032	0.0045	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Mar	49.25	43.96	54.55	51.98	0.0044	0.0037	0.0054	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Apr	53.24	46.98	59.49	51.98	0.0051	0.0041	0.0064	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	May	57.74	50.54	64.93	51.98	0.0060	0.0046	0.0077	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Jun	62.65	54.94	70.36	51.98	0.0072	0.0055	0.0091	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Jul	66.53	58.63	74.43	51.98	0.0081	0.0062	0.0103	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Aug	65.15	57.72	72.57	51.98	0.0078	0.0060	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Sep	59.98	52.93	67.04	51.98	0.0065	0.0051	0.0083	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Oct	54.07	48.01	60.13	51.98	0.0053	0.0042	0.0065	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Nov	48.04	43.61	52.46	51.98	0.0042	0.0036	0.0050	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Dec	42.89	39.34	46.44	51.98	0.0035	0.0031	0.0040	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

212 - Vertical Fixed Roof Tank
Salt Lake City, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	15.5840	18.6153	27.1567	35.7598	49.0882	59.1433	69.9966	63.3520	49.5869	36.8526	21.2247	14.8928
Vapor Space Volume (cu ft):	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Space Expansion Factor:	0.0305	0.0359	0.0418	0.0489	0.0559	0.0593	0.0604	0.0569	0.0545	0.0473	0.0350	0.0283
Vented Vapor Saturation Factor:	0.9966	0.9962	0.9957	0.9949	0.9940	0.9929	0.9920	0.9923	0.9936	0.9948	0.9958	0.9965
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760
Tank Diameter (ft):	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000
Vapor Space Outage (ft):	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333
Tank Shell Height (ft):	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000
Average Liquid Height (ft):	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000
Roof Outage (ft):	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333
Roof Outage (Cone Roof)												
Roof Outage (ft):	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333
Roof Height (ft):	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000
Roof Slope (ft/ft):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Shell Radius (ft):	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Daily Avg. Liquid Surface Temp. (deg. R):	501.8630	505.0233	508.9222	512.9051	517.4062	522.3207	526.2015	524.8172	519.6544	513.7415	507.7078	502.5640
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0305	0.0359	0.0418	0.0489	0.0559	0.0593	0.0604	0.0569	0.0545	0.0473	0.0350	0.0283
Daily Vapor Temperature Range (deg. R):	15.2493	18.0717	21.1784	25.0031	28.7750	30.8446	31.5898	29.7004	28.2084	24.2312	17.7078	14.2011
Daily Vapor Pressure Range (psia):	0.0008	0.0013	0.0018	0.0023	0.0031	0.0036	0.0041	0.0037	0.0032	0.0023	0.0014	0.0009
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0031	0.0032	0.0037	0.0041	0.0046	0.0055	0.0062	0.0060	0.0051	0.0042	0.0036	0.0031
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0039	0.0045	0.0054	0.0064	0.0077	0.0091	0.0103	0.0098	0.0083	0.0065	0.0050	0.0040
Daily Avg. Liquid Surface Temp. (deg R):	501.8630	505.0233	508.9222	512.9051	517.4062	522.3207	526.2015	524.8172	519.6544	513.7415	507.7078	502.5640
Daily Min. Liquid Surface Temp. (deg R):	498.0506	500.5054	503.6276	506.6543	510.2125	514.6095	518.3040	517.3921	512.6023	507.6837	503.2808	499.0138
Daily Max. Liquid Surface Temp. (deg R):	505.6753	509.5412	514.2168	519.1559	524.5999	530.0318	534.0989	532.2423	526.7065	519.7993	512.1348	506.1143
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9966	0.9962	0.9957	0.9949	0.9940	0.9929	0.9920	0.9923	0.9936	0.9948	0.9958	0.9965
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035

Vapor Space Outage (ft):	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333
Working Losses (lb):	3.0761	3.4756	20.2764	23.7442	27.8971	33.0428	37.5185	35.9220	29.9713	4.7981	3.8149	3.1647
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Net Throughput (gal/mo.):	291,695.8300	291,695.8300	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	291,695.8300	291,695.8300	291,695.8300
Annual Turnovers:	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000
Maximum Liquid Height (ft):	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000
Tank Diameter (ft):	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	18.6601	22.0908	47.4331	59.5040	76.9853	92.1861	107.5151	99.2740	79.5582	41.6507	25.0396	18.0575

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

212 - Vertical Fixed Roof Tank
Salt Lake City, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	226.70	461.25	687.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	213
City:	Salt Lake City
State:	Utah
Company:	
Type of Tank:	Vertical Fixed Roof Tank
Description:	LS2

Tank Dimensions

Shell Height (ft):		29.50
Diameter (ft):		117.00
Liquid Height (ft) :		27.00
Avg. Liquid Height (ft):		12.00
Volume (gallons):		2,378,000.00
Turnovers:		5.00
Net Throughput(gal/yr):		11,891,395.83
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		3.70
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

213 - Vertical Fixed Roof Tank
Salt Lake City, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	Jan	42.19	38.38	46.01	51.98	0.0034	0.0031	0.0039	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Feb	45.35	40.84	49.87	51.98	0.0038	0.0032	0.0045	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Mar	49.25	43.96	54.55	51.98	0.0044	0.0037	0.0054	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Apr	53.24	46.98	59.49	51.98	0.0051	0.0041	0.0064	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	May	57.74	50.54	64.93	51.98	0.0060	0.0046	0.0077	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Jun	62.65	54.94	70.36	51.98	0.0072	0.0055	0.0091	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Jul	66.53	58.63	74.43	51.98	0.0081	0.0062	0.0103	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Aug	65.15	57.72	72.57	51.98	0.0078	0.0060	0.0098	130.0000			188.00	Option 1: VP60 = .0065 VP70 = .009
Distillate fuel oil no. 2	Sep	59.98	52.93	67.04	51.98	0.0065	0.0051	0.0083	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Oct	54.07	48.01	60.13	51.98	0.0053	0.0042	0.0065	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065
Distillate fuel oil no. 2	Nov	48.04	43.61	52.46	51.98	0.0042	0.0036	0.0050	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045
Distillate fuel oil no. 2	Dec	42.89	39.34	46.44	51.98	0.0035	0.0031	0.0040	130.0000			188.00	Option 1: VP40 = .0031 VP50 = .0045

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

213 - Vertical Fixed Roof Tank
Salt Lake City, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	15.5840	18.6153	27.1567	35.7598	49.0882	59.1433	69.9966	63.3520	49.5869	36.8526	21.2247	14.8928
Vapor Space Volume (cu ft):	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Space Expansion Factor:	0.0305	0.0359	0.0418	0.0489	0.0559	0.0593	0.0604	0.0569	0.0545	0.0473	0.0350	0.0283
Vented Vapor Saturation Factor:	0.9966	0.9962	0.9957	0.9949	0.9940	0.9929	0.9920	0.9923	0.9936	0.9948	0.9958	0.9965
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760	201,407.9760
Tank Diameter (ft):	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000
Vapor Space Outage (ft):	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333
Tank Shell Height (ft):	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000	29.5000
Average Liquid Height (ft):	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000	12.0000
Roof Outage (ft):	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333
Roof Outage (Cone Roof)												
Roof Outage (ft):	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333	1.2333
Roof Height (ft):	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000
Roof Slope (ft/ft):	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Shell Radius (ft):	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000	58.5000
Vapor Density												
Vapor Density (lb/cu ft):	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Daily Avg. Liquid Surface Temp. (deg. R):	501.8630	505.0233	508.9222	512.9051	517.4062	522.3207	526.2015	524.8172	519.6544	513.7415	507.7078	502.5640
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0305	0.0359	0.0418	0.0489	0.0559	0.0593	0.0604	0.0569	0.0545	0.0473	0.0350	0.0283
Daily Vapor Temperature Range (deg. R):	15.2493	18.0717	21.1784	25.0031	28.7750	30.8446	31.5898	29.7004	28.2084	24.2312	17.7078	14.2011
Daily Vapor Pressure Range (psia):	0.0008	0.0013	0.0018	0.0023	0.0031	0.0036	0.0041	0.0037	0.0032	0.0023	0.0014	0.0009
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0031	0.0032	0.0037	0.0041	0.0046	0.0055	0.0062	0.0060	0.0051	0.0042	0.0036	0.0031
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0039	0.0045	0.0054	0.0064	0.0077	0.0091	0.0103	0.0098	0.0083	0.0065	0.0050	0.0040
Daily Avg. Liquid Surface Temp. (deg R):	501.8630	505.0233	508.9222	512.9051	517.4062	522.3207	526.2015	524.8172	519.6544	513.7415	507.7078	502.5640
Daily Min. Liquid Surface Temp. (deg R):	498.0506	500.5054	503.6276	506.6543	510.2125	514.6095	518.3040	517.3921	512.6023	507.6837	503.2808	499.0138
Daily Max. Liquid Surface Temp. (deg R):	505.6753	509.5412	514.2168	519.1559	524.5999	530.0318	534.0989	532.2423	526.7065	519.7993	512.1348	506.1143
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9966	0.9962	0.9957	0.9949	0.9940	0.9929	0.9920	0.9923	0.9936	0.9948	0.9958	0.9965
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035

Vapor Space Outage (ft):	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333	18.7333
Working Losses (lb):	3.0761	3.4756	20.2764	23.7442	27.8971	33.0428	37.5185	35.9220	29.9713	4.7981	3.8149	3.1647
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0034	0.0038	0.0044	0.0051	0.0060	0.0072	0.0081	0.0078	0.0065	0.0053	0.0042	0.0035
Net Throughput (gal/mo.):	291,695.8300	291,695.8300	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	1,490,416.6700	291,695.8300	291,695.8300	291,695.8300
Annual Turnovers:	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006	5.0006
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000	2,378,000.0000
Maximum Liquid Height (ft):	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000	27.0000
Tank Diameter (ft):	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000	117.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	18.6601	22.0908	47.4331	59.5040	76.9853	92.1861	107.5151	99.2740	79.5582	41.6507	25.0396	18.0575

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

213 - Vertical Fixed Roof Tank
Salt Lake City, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	226.70	461.25	687.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	246
City:	Salt Lake City
State:	Utah
Company:	
Type of Tank:	External Floating Roof Tank
Description:	LS1

Tank Dimensions

Diameter (ft):	50.00
Volume (gallons):	441,000.00
Turnovers:	41.71

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	6
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Float	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

246 - External Floating Roof Tank
Salt Lake City, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	Jan	42.19	38.38	46.01	51.98	0.0045	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Feb	45.35	40.84	49.87	51.98	0.0051	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Mar	49.25	43.96	54.55	51.98	0.0059	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Apr	53.24	46.98	59.49	51.98	0.0068	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	May	57.74	50.54	64.93	51.98	0.0079	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	Jun	62.65	54.94	70.36	51.98	0.0092	N/A	N/A	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Jul	66.53	58.63	74.43	51.98	0.0101	N/A	N/A	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Aug	65.15	57.72	72.57	51.98	0.0098	N/A	N/A	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Sep	59.98	52.93	67.04	51.98	0.0085	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	Oct	54.07	48.01	60.13	51.98	0.0070	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	Nov	48.04	43.61	52.46	51.98	0.0056	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Dec	42.89	39.34	46.44	51.98	0.0046	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

246 - External Floating Roof Tank
Salt Lake City, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	0.1742	0.2105	0.2711	0.3239	0.3706	0.4280	0.4777	0.4698	0.3859	0.3007	0.2291	0.1813
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	7.5000	8.1000	9.3000	9.6000	9.4000	9.4000	9.5000	9.7000	9.1000	8.5000	8.0000	7.6000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0045	0.0051	0.0059	0.0068	0.0079	0.0092	0.0101	0.0098	0.0085	0.0070	0.0056	0.0046
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281
Net Throughput (gal/mo.):	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Roof Fitting Losses (lb):	1.0481	1.3701	2.0342	2.5114	2.8119	3.2474	3.6643	3.6821	2.8317	2.0567	1.4721	1.1058
Value of Vapor Pressure Function:	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,083.1428	1,249.7139	1,620.8222	1,721.5124	1,654.0338	1,654.0338	1,687.5972	1,755.7794	1,555.4542	1,367.7908	1,221.0735	1,110.0261
Average Wind Speed (mph):	7.5000	8.1000	9.3000	9.6000	9.4000	9.4000	9.5000	9.7000	9.1000	8.5000	8.0000	7.6000
Total Losses (lb):	8.4504	8.8087	9.5334	10.0633	10.4106	10.9035	11.3701	11.3800	10.4457	9.5855	8.9293	8.5152

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	0.0292
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	0.7026
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	0.0245
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	6	0.82	0.53	0.14	0.1650
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Float	1	31.00	36.00	2.00	26.7457
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.2367

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

246 - External Floating Roof Tank
Salt Lake City, Utah

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Jet kerosene	3.82	86.74	27.84	0.00	118.40

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	247
City:	Salt Lake City
State:	Utah
Company:	
Type of Tank:	External Floating Roof Tank
Description:	LS1

Tank Dimensions

Diameter (ft):	50.00
Volume (gallons):	441,000.00
Turnovers:	41.71

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Double Deck
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	6
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Float	1

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

247 - External Floating Roof Tank
Salt Lake City, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Jet kerosene	Jan	42.19	38.38	46.01	51.98	0.0045	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Feb	45.35	40.84	49.87	51.98	0.0051	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Mar	49.25	43.96	54.55	51.98	0.0059	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Apr	53.24	46.98	59.49	51.98	0.0068	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	May	57.74	50.54	64.93	51.98	0.0079	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	Jun	62.65	54.94	70.36	51.98	0.0092	N/A	N/A	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Jul	66.53	58.63	74.43	51.98	0.0101	N/A	N/A	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Aug	65.15	57.72	72.57	51.98	0.0098	N/A	N/A	130.0000			162.00	Option 1: VP60 = .0085 VP70 = .011
Jet kerosene	Sep	59.98	52.93	67.04	51.98	0.0085	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	Oct	54.07	48.01	60.13	51.98	0.0070	N/A	N/A	130.0000			162.00	Option 1: VP50 = .006 VP60 = .0085
Jet kerosene	Nov	48.04	43.61	52.46	51.98	0.0056	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006
Jet kerosene	Dec	42.89	39.34	46.44	51.98	0.0046	N/A	N/A	130.0000			162.00	Option 1: VP40 = .0041 VP50 = .006

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

247 - External Floating Roof Tank
Salt Lake City, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	0.1742	0.2105	0.2711	0.3239	0.3706	0.4280	0.4777	0.4698	0.3859	0.3007	0.2291	0.1813
Seal Factor A (lb-mole/ft-yr):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000	0.4000
Average Wind Speed (mph):	7.5000	8.1000	9.3000	9.6000	9.4000	9.4000	9.5000	9.7000	9.1000	8.5000	8.0000	7.6000
Seal-related Wind Speed Exponent:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Value of Vapor Pressure Function:	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0045	0.0051	0.0059	0.0068	0.0079	0.0092	0.0101	0.0098	0.0085	0.0070	0.0056	0.0046
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281	7.2281
Net Throughput (gal/mo.):	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000	1,533,000.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000	7.0000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Roof Fitting Losses (lb):	1.0481	1.3701	2.0342	2.5114	2.8119	3.2474	3.6643	3.6821	2.8317	2.0567	1.4721	1.1058
Value of Vapor Pressure Function:	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	1,083.1428	1,249.7139	1,620.8222	1,721.5124	1,654.0338	1,654.0338	1,687.5972	1,755.7794	1,555.4542	1,367.7908	1,221.0735	1,110.0261
Average Wind Speed (mph):	7.5000	8.1000	9.3000	9.6000	9.4000	9.4000	9.5000	9.7000	9.1000	8.5000	8.0000	7.6000
Total Losses (lb):	8.4504	8.8087	9.5334	10.0633	10.4106	10.9035	11.3701	11.3800	10.4457	9.5855	8.9293	8.5152

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	0.2367
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	0.0292
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00	0.0245
Automatic Gauge Float Well/Unbolted Cover, Gasketed	1	4.30	17.00	0.38	0.7026
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	6	0.82	0.53	0.14	0.1650
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Float	1	31.00	36.00	2.00	26.7457

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

247 - External Floating Roof Tank
Salt Lake City, Utah

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Jet kerosene	3.82	86.74	27.84	0.00	118.40

TANKS 4.0.9d
Emissions Report - Detail Format
Total Emissions Summaries - All Tanks in Report

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

Tank Identification			Losses (lbs)
204	Vertical Fixed Roof Tank	Salt Lake City, Utah	655.95
212	Vertical Fixed Roof Tank	Salt Lake City, Utah	687.95
213	Vertical Fixed Roof Tank	Salt Lake City, Utah	687.95
246	External Floating Roof Tank	Salt Lake City, Utah	118.40
247	External Floating Roof Tank	Salt Lake City, Utah	118.40
Total Emissions for all Tanks:			2,268.65

Attachment C

Form 1 and NOI Checklist

Utah Division of Air Quality
New Source Review Section

Date 11/30/12

Form 1
Notice of Intent (NOI)

Application for: ☐Initial Approval Order ☒Approval Order Modification

APPROVAL ORDER MUST BE ISSUED BEFORE ANY CONSTRUCTION OR INSTALLATION CAN BEGIN. This is not a stand alone document; please refer to UAC R307-401and the published NOI guidebook for information on requirements of the specified information below. Please print or type all information requested. All outlined information requested must be accurate and completed before DAQ can determine that an NOI is complete and an engineering review can be initiated. If you have any questions, contact the Division of Air Quality at (801) 536-4000 and ask to speak with a New Source Review Engineer. Written inquiries may be addressed to: Division of Air Quality, New Source Review Section, P.O. Box 144820, Salt Lake City, Utah 84114-4820.

General Owner and Facility Information	R307-401-5(2)(k)
1. Filing Fee Paid*	2. Application Fee Paid*
3. Company name and address: Tesoro Refining and Marketing Company 474 West 900 North Salt Lake City, UT 84103 Phone No.: (801) 366-2036 Fax No.: (801)521-4965	4. Company** contact for environmental matters: Matthew Buell Phone no.: (801) 521-4966 Email: *** Company contact only; consultant or independent contractor contact information can be provided in a cover letter*
5. Owners name and address: Tesoro Corporation 19100 Ridgewood Parkway San Antonio, TX 78259 Phone no.: Fax no.:	6. Property Universal Transverse Mercator coordinates (UTM), including System and Datum: Easting: 423,400 Northing: 4,515,950 System: UTM Zone 12 Datum:
7. County where the facility is located in: Salt Lake	8. Standard Industrial Classification Code 2911
9. Designation of facility in an attainment, maintenance, or nonattainment area(s): SL City CO Maint Area SL Co Ozone Maint Area SL Co PM10 NAA SL Co PM2.5 NAA SL Co SO2 NAA	

10. If request for modification, AO# to be modified: DAQE#See Attached List Date:

11. Identify any current Approval Order(s) for the facility **not** being modified with this request:

AO#See Attached List Date
AO# Date
AO# Date
AO# Date

12. Application for:

☐New construction
☐Existing equipment operating without permit
☒Change of permit condition
☒Modification
☐Permanent site for Portable Approval Order
☐Change of location

13. Construction or modification estimated start date:5/1/13 Estimated completion date:6/1/13

R307-401-5(2)(h)

14. Does this application contain justifiable confidential data? ☐Yes ☒ No

15. Current Title V (Operating Permit) Identification: Date

☐Requesting an enhanced Title V permit with this AO modification

16. Brief (50 words or less) description of project to post on DAQ web for public awareness

This project will convert the existing gasoline hydrotreater into a kerosene hydrotreater during the winter months when desulfurization of Heavy Catalytic Naphtha from the Fluidized Catalytic Cracking Unit to produce gasoline is unnecessary. Minor operational and hardware changes are needed to complete this conversion.

Process Information

17. Appendix A: Detailed description of project including process flow diagram (Forms 2-23)

☒Fuels and their use
☒Raw materials used
☒Production rates (including daily/seasonal variances)
☒Equipment used in process
☒Operation schedules
☒Description of product(s)
☒Description of changes to process (if applicable)

R307-401-5(2)(a)

18. Appendix B: Site plan of facility with all emission points and elevations, building dimensions, stack parameters included

R307-401-5(2)(e)

Emissions Information

19. Appendix C: Emission Calculations that must include:
    - ☒ Emissions per new/modified unit for each of the following: PM_{10}, $PM_{2.5}$, NO_x, SO_x, CO, VOC, and HAPs
    - ☒ Designation of fugitive and non fugitive emissions
    - ☒ Major GHG Sources: Emissions per new/modified unit for GHGs (in CO_2e short tons per year)
    - ☒ References/assumptions for each Emission Factor used in calculating Criteria pollutant, HAP, and GHG emissions
    - ☒ HAP emissions (in pounds per hour and tons per year) broken out by specific pollutant and summed as a total

    R307-401-5(2)(b)

20. Appendix D: DAQ Form 1a or equivalent (comparison of existing emissions to proposed emission and resulting new total emissions)

21. Appendix E: Source Size determination (Minor, Synthetic Minor, Major, or PSD)
    - ☒ If an Existing Major Source: Determination of Minor, Major or PSD modification

22. Appendix F: Offset requirements (nonattainment/maintenance areas)
    - ☐ Acquired required offsets

    R307-401-420 & R307-401-421

Air Pollution Control Equipment Information

23. Appendix G: Best Available Control Technology (BACT) analysis for the proposed source or modification

    R307-401-5(2)(d)

24. Appendix H: Detailed information on all new/modified equipment controls. It is strongly recommended using DAQ forms as they outline required information, but something equivalent to the DAQ forms is acceptable.

    R307-401-5(2)(c)

25. Appendix I: Discussion of Federal/State requirement applicability (NAAQS, SIP, NSPS, NESHAP, etc)

Modeling Information

26. Appendix J: Emissions Impact Analysis (if applicable)

    R307-410-4

Electronic NOI

27. A complete and accurate electronic NOI submitted

    R307-401-5(1)

I hereby certify that the information and data submitted in and with this application is completely true, accurate and complete, based on reasonable inquiry made by me and to the best of my knowledge and belief.

Signature: Title:

Name (print)	Telephone Number:	Date:

**with the exception of Federal Agencies who will be billed at completion of the project*

Form 1 (NOI) Continued

4. Company Contact Email: matthew.w.buell@tsocorp.com

10. Approval Orders to be modified:

    DAQE-AN0103350058-12, September 13, 2012

11. Current Approval Orders not being modified:

    DAQE-AN0103350059-12, September 13, 2012

Utah Division of Air Quality

NOTICE OF INTENT COMPLETENESS CHECKLIST

TO BE COMPLETED BY PROJECT ENGINEER WITHIN 30 DAYS OF RECEIPT OF THE NOTICE OF INTENT (NOI). CRITERIA DERIVED FROM R307-401-5, UTAH ADMINISTRATIVE CODE (UAC). ANY NEGATIVE RESPONSE WILL CAUSE APPLICATION TO BE DELAYED. ALL REFERENCES ARE TO THE UAC EXCEPT AS NOTED.

Project Name: Date:

1. Fees Paid
   - A. Filing Fee — Cover letter — Y ☐ N ☐
   - B. Application Fee — Y ☐ N ☐

2. Source Identification Information: [R307-401-5(2)(k)]
   - A. Name, address, and telephone number (w/area code) — Y ☐ N ☐
   - B. Company submitting application — Y ☐ N ☐
   - C. Plant manager and/or Company contact — Y ☐ N ☐
   - D. Plant (if different from Company) — Y ☐ N ☐ N/A ☐
   - E. Company owner and agent — Y ☐ N ☐
   - F. Property UTM coordinates — Y ☐ N ☐
   - G. County where facility is located — Y ☐ N ☐
   - H. SIC Code(s) — Y ☐ N ☐
   - I. Facility area designation (attainment, maintenance, or nonattaiment) — Y ☐ N ☐

   Form 1
   General information in Sections 1.0 and 2.1

3. If modification, AO# to be modified [R307-401-5(2)(k)] — Form 1 — Y ☐ N ☐ N/A ☐
   - A. Other current Approval Order(s) for facility not being modified — Y ☐ N ☐ N/A ☐
   - B. Current Title V (Operating Permit) — Y ☐ N ☐ N/A ☐

4. Purpose of application [R307-401-5(2)(a)] — Form 1 Section 1.0 — Y ☐ N ☐

5. Construction schedule [R307-401-5(2)(h)] — Form 1 Section 2.5 — Y ☐ N ☐ N/A ☐

6. Justifiable confidential data — N/A — Y ☐ N ☐ N/A ☐

7. Description of Source Process. [R307-401-5(2)]
   - A. Detailed description of project: [(Appendix A) (Forms 2-23)]
     1. Fuels and their use — Y ☐ N ☐
     2. Raw materials used — Y ☐ N ☐ N/A ☐
     3. Description of product(s) — Y ☐ N ☐
     4. Equipment used in process — Y ☐ N ☐
     5. Operation schedules — Y ☐ N ☐
     6. Description of changes to process — Y ☐ N ☐ N/A ☐
     7. Production rates — Y ☐ N ☐ N/A ☐

   Section 2.0 and sub-sections

B. Site plan of facility with, building dimensions, stack parameters included: (Appendix B) Y ☐ N ☐

1. Emission points and elevations — Attachment A; No stack parameters included (no modeling analysis) — Y ☐ N ☐
2. Building dimensions — Y ☐ N ☐ N/A ☐
3. Stack parameters — Y ☐ N ☐ N/A ☐

8. Emissions Related Information. [R307-401-(2)(b)]

A. Emission Calculations: (Appendix C)

1. Emissions per new/modified unit for all pollutants: (PM_{10}, $PM_{2.5}$ NO_x, SO_x, CO, VOC, and HAPs) — Section 3.0 and subsections; Attachment B — Y ☐ N ☐
2. Designation of fugitive and non-fugitive emissions — Y ☐ N ☐
3. Major GHG Sources: (in CO2e short tons per year) — Y ☐ N ☐ N/A ☐
4. References/assumptions for each calculation and pollutant — Y ☐ N ☐
5. HAP emissions (broken out by specific pollutant in pounds per hr) — Y ☐ N ☐ N/A ☐
6. Applicable Material Safety Data Sheets — Y ☐ N ☐

B. DAQ Form 1a or equivalent (Appendix D) — Attachment B — Y ☐ N ☐

C. Source size determination (Appendix E) — Section 3.0 and sub-sections

1. If Existing Major Source: Determination of Minor, Major, or PSD Modification — Y ☐ N ☐ N/A ☐

D. Offset requirements (nonattainment/maintenance areas) [(R307-401-420)(R307-401-421)] (Appendix F) — Sections 4.9, 4.10 (not applicable) — Y ☐ N ☐ N/A ☐

1. Acquired required offsets — Y ☐ N ☐ N/A ☐

9. Air Pollution Control Equipment — Section 4.5.1

A. Best Available Control Technology (BACT) Analysis [R307-401-5(2)(d), (Appendix G)] — Y ☐ N ☐

B. Detailed information on new/modified equipment controls [R307-401-5(2)(c), (Appendix H)] — Y ☐ N ☐

10. Federal/State requirement applicability [(NAAQS, SIP, NSPS, etc), (Appendix I) — Y ☐ N ☐ N/A ☐

11. Modeling information — Section 4.0 and sub-sections

A. Emissions Impact Analysis [(R307-410-4), (Appendix J)] — Section 4.8 — Y ☐ N ☐ N/A ☐

12. Signature on application (Form 1 Notice of Intent) — Form 1 — Y ☐ N ☐