



3900 Essex Lane, Suite 700
Houston, TX 77027
(713) 395-6200

November 11, 2022

Mr. Josh Alexander (Joshua.Alexander@deq.oregon.gov)
Department of Environmental Quality
Northwest Region Portland Office
700 NE Multnomah Street, Suite 600
Portland, OR 97232-4100

Re: Submittal of Air Contaminant Discharge Permit Application for Zenith Energy Terminal Facility

Dear Mr. Alexander:

Zenith Energy Terminals Holdings LLC (“Zenith”) is submitting to you an application for an Air Contaminant Discharge Permit (“ACDP”) for its existing terminal located at 5501 NW Front Ave in Portland (the “Facility”).

With this application Zenith is proposing to split the terminal operations from the refinery operations such that the Facility is a separate source covered by its own ACDP. The Facility has to date operated under Title V Permit No. 26-2025. The refinery operations will remain under Title V Permit No. 26-2025 until that permit is terminated. Zenith has committed to the City of Portland to request termination of the refinery Title V permit upon completion of all appeals and petitions (if any) such that the Facility ACDP is in full force and effect.

Zenith is requesting that the new ACDP include the requirement that the Facility cease the handling and storage of crude oil (whether by rail, marine or otherwise) after October 3, 2027. The application materials include emissions associated with crude oil in the emissions inventory as Zenith anticipates handling some amount of crude oil in the period between now and October 3, 2027 as the Facility transitions to exclusively handling renewable fuels and non-fuel products. As crude oil handling is eliminated, the need for the crude oil-related emission factors will end and, upon the next permit renewal after October 3, 2027, crude oil emission factors can be eliminated from the permit.

Zenith is also requesting that the new ACDP limit Volatile Organic Compound (“VOC”) emissions to 39 tons/year on a rolling 12 month basis. At all times that the ACDP is in effect (i.e., both before and after the phase-out of crude oil), Zenith will comply with the 39 ton/year VOC Plant Site Emission Limit.



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Zenith is eager to have the ACDP issued expeditiously. If there is anything that we can do to assist your team with its review and processing of the application, please do not hesitate to call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Shannon Caldwell'.

Shannon Caldwell

cc: Grady Reamer
Dana Love
John Browning
Tom Wood
BDS Land Use Services (w/copy of application)

Application for a
Standard Air Contaminant Discharge Permit

Zenith Energy Terminal Facility
Portland, Oregon

Prepared for:
Zenith Energy Terminals Holdings LLC

November 11, 2022

BRIDGEWATER GROUP, INC.

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1.0 Introduction

Zenith Energy Terminals Holdings LLC (Zenith) owns and operates an asphalt refinery and collocated liquid warehouse and storage terminal located at 5501 NW Front Avenue in Portland, Oregon. A site vicinity map showing the terminal location is presented in Figure 1-1.

Zenith is requesting that the Oregon Department of Environmental Quality (ODEQ) issue the liquid warehouse and storage terminal (Zenith Energy Terminal Facility or terminal) a Standard Air Contaminant Discharge Permit (ACDP) so that the terminal is separately permitted from the refinery.

The Zenith Energy Terminal Facility, which is within the Heavy Industrial (IH) land use zone, is an existing petroleum, petroleum products, and renewable fuels bulk distribution terminal (SIC 4226, NAICS 493190), including bulk storage tanks, railcar unloading spots, rail and truck loading racks, a marine vapor combustion unit (which destroys emissions associated with marine loading of volatile organic liquids stored at the terminal), piping, oil/water separators, fire suppression equipment and facilities, and other associated structures, facilities and equipment.

The ODEQ forms in support of the ACDP application are provided in Appendix A. The signed land use compatibility statement (LUCS) is included in Appendix B.

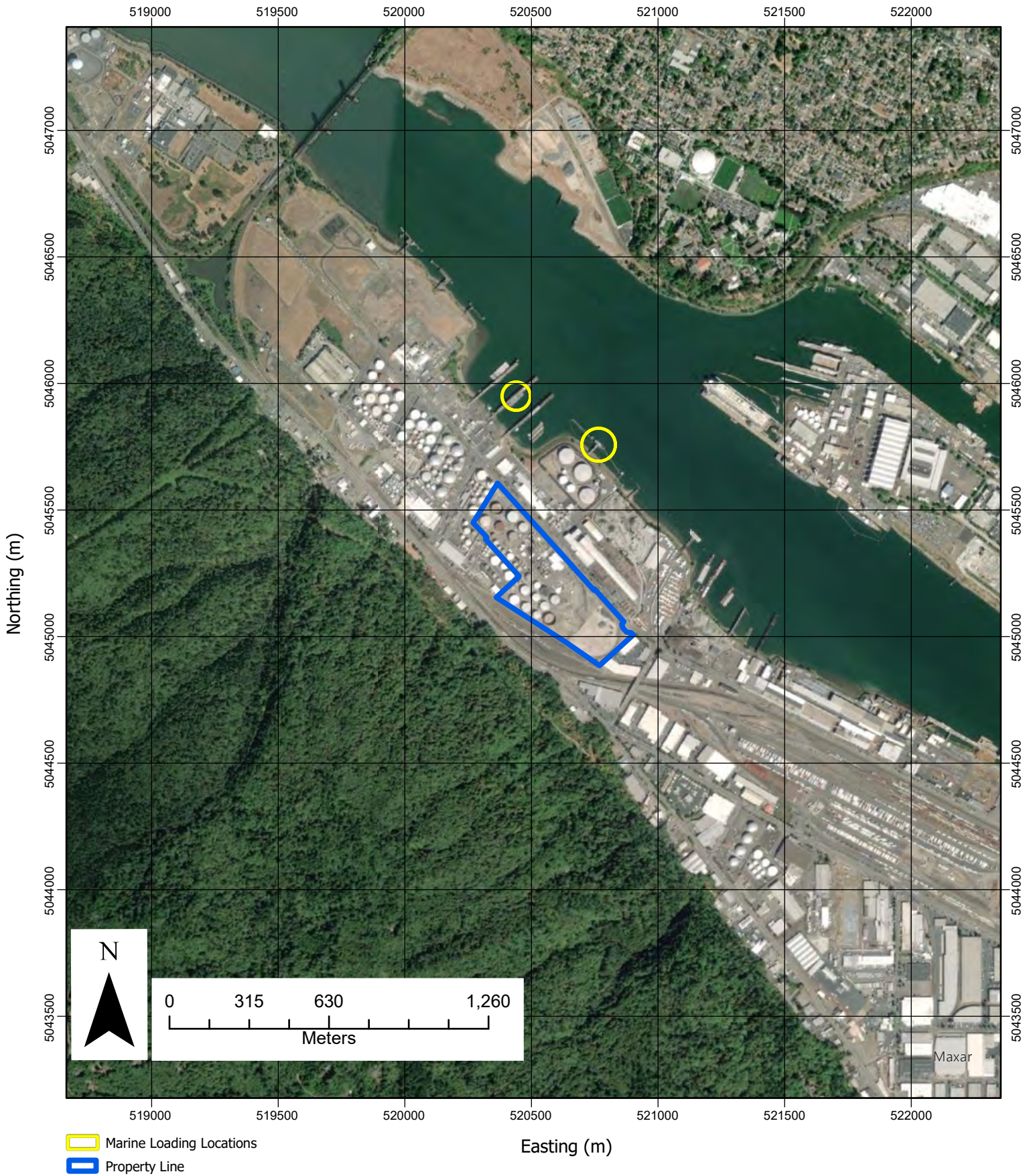


Figure 1-1
 Zenith Energy Terminal Facility Location
 5501 NW Front Avenue

2.0 Process Information

The Zenith Energy Terminal Facility receives liquid products, stores the products in onsite storage tanks and ships the products offsite. The liquid products can be received (unloaded) or shipped (loaded) by tanker trucks, rail tank cars, marine vessels or pipeline. Some of the products may require heat to keep them fluid enough for storage and/or shipping. Heat is provided by two boilers and one heater. The diagram showing the process flow of products is presented in Figure 2-1. A site plot plan that shows the locations of tanks and equipment is included in Figure 2-2.

2.1 Crude Oil Phase-Out

The Zenith Energy Terminal Facility currently handles a wide variety of liquid products including crude oil. The company has committed to permanently cease handling of crude oil by October 3, 2027. Increased handling of existing products as well as alternative non-crude products will occur in lieu of crude oil. Products handled at the facility currently or that are presently anticipated in the future are identified in Table 2-1. Other products may be added to this list as markets change and develop over time.

Table 2-1: Terminal Products

Crude Oil (prior to 10/03/2027)
Aviation Gasoline (Av-Gas)
Distillates Category: Biodiesel, Renewable Diesel, Ultra-low Sulfur Diesel, Jet Fuel (Jet A, Jet Kerosene), Sustainable Aviation Fuel
Ethanol with up to 5% gasoline
Renewable Naphtha
Renewable Feedstocks*

*Includes products like soy bean oil, distillers corn oil, used cooking oil, yellow grease, tallow, choice white grease, camelina oil, carinata oil, and canola oil.

2.2 Receiving

Products can be received by pipeline, tanker truck, rail tank car or marine vessel (ship or barge). Crude oil, ethanol, and renewable naphtha typically will be received by railcar. Av-gas usually arrives via pipeline but can arrive by marine vessel. The other products can be received by truck, railcar or marine vessel.

There are four existing truck racks (TRACK 5, 6, 7 and 8) and four existing railcar racks (TRACK_RC 1A, 1B, 2 and 3) with 44 railcar unloading positions. Crude oil is currently only handled in 36 of the 44 railcar unloading positions; no crude oil is currently unloaded from railcar spots 501 to 504 or 701 to 704 and after October 3, 2027, crude oil will not be handled anywhere at the terminal. Zenith plans to add four more railcar racks (Manifest Racks TRACK_RC 4, 5, 6 and 7) for product unloading in the future. No crude oil will be handled in the Manifest Racks.

Unloading of products from marine vessels occurs at two neighboring docks, Chevron (MLOAD-C) and McCall Oil (MLOAD-M). The products are unloaded and transferred by pipeline to Zenith storage tanks.

2.3 Storage

There are three types of storage tanks at the terminal; fixed roof tanks, external floating roof tanks and internal floating roof tanks. A list of tank types and tank numbers that are included in this application is provided in Table 2-2. Table 2-2 does not include any of the 30 tanks that Zenith has committed to remove prior to October 3, 2029 as none of these tanks are currently in service and nor will they be placed in service prior to removal. Details of tank design and capacity for the tanks in Table 2-2 are presented in the individual tank device forms (AQ205) in Appendix A.

Table 2-2: Inventory of Tanks

Roof Type	Tank Numbers
Fixed Roof > 39,000 gal	66, 67, 69, 70, 74, 93, 100, 101, 102, 110, 111, 112, 113, 121, 122, 123, 124, 125, 126, 127, 128, 129, 166, 167, 168, 170, 171, 172, 173, 174, 182, 183, 184, 185
Fixed Roof < 39,000 gal	169, 179, 180, 202, 203, 204, 205, 207, 208, 209, 211, 213, 306, 307, 317
External Floating	105, 106, 120
Internal Floating Roof	63, 68, 71, 95, 104, 114, 130

Fixed roof tanks generally consist of a cylindrical steel shell with a permanently affixed roof, which may vary in design from cone or dome-shaped to flat. There are 34 fixed roof storage tanks that have a storage capacity greater than 39,000 gallons. There are 15 fixed roof tanks with a storage capacity less than 39,000 gallons. Fixed roof tanks are used to store low volatility products such as renewable feedstocks, biodiesel and other distillate category products.

There are three external floating roof tanks at the terminal. Two of the external floating roof tanks (No. 105 and 106) were installed in 1975 and 1980, respectively, and were retrofitted with secondary seals in 1998 and 1996.

An internal floating roof tank has both a permanent fixed cone roof and a floating deck inside. The deck is free to move vertically as the liquid level rises and falls and either floats on the liquid surface or rests on pontoons several inches above the liquid surface. There are seven internal floating roof storage tanks at the terminal.

Floating roof tanks are used to store products with higher volatility including products like crude oil, av-gas, ethanol and renewable naphtha but may also be used for low volatility products (i.e., distillates and renewable feedstocks). Tank 71 is the only tank used for Av-gas storage.

Zenith has committed that no new fossil fuel storage tanks may be constructed at the facility. This limitation does not preclude the construction of new storage tanks, after notification to and approval by ODEQ consistent with the requirements of OAR 340-210, so long as any such new storage tank is used solely for renewable fuels or non-fossil fuel products. This limitation does not preclude refurbishment or any other improvements to existing storage tanks for the purpose of storing fossil fuels. No tank at the terminal shall be used to store crude oil after October 3, 2027.

2.4 Shipping

The truck racks (TRACK 5, 6, 7, 8), railcar racks (TRACK_RC 1A, 1B, 2, 3) and marine vessel docks (MLOAD-C and MLOAD-M) are used to load products for shipping. The future railcar racks (Manifest Racks TRACK_RC 4, 5, 6, 7) will not be used for shipping.

Crude oil (prior to 10/03/2027), ethanol and renewable naphtha are higher volatility products that will be shipped by marine vessel. Vapors generated during ship or barge loading of volatile organic liquids with a Reid vapor pressure of 4.0 psi or more will be captured and sent to the marine vapor combustion unit (MVCU) for emission control. Distillates and renewable feedstocks also will be shipped via marine vessel but emission control is not required when loading these products as their Reid vapor pressure is less than 4.0 psi.

In the future if higher volatility products are shipped via truck or rail tank car, the vapors generated during loading will be captured and sent to the MVCU for emission control.

Av-gas will be shipped offsite via pipeline.

Low volatility products will be loaded into tanker trucks, railcars or marine vessels for shipment.

2.5 Boilers and Heater

The boilers and heater are used at the terminal to generate heat as needed to keep heavier viscous liquid products transportable and protect against freezing. The boilers and heater at the facility are:

Table 2-2: List of Boilers and Heater

Equipment	Fuel	Capacity	Year Installed
Cleaver Brooks boiler (B4)	Natural gas	16.738 MM Btu/hr	1990
Johnston Boiler #5 (B5)	Natural gas	16.8 MM Btu/hr	1996
Hot Oil Loop Heater (F2)	Natural gas	15 MM Btu/hr	1946

2.6 Oil/Water Separators

There are two oil/water separators at the terminal. The larger separator (Oil/W1) is located between tanks 63 and 100. The smaller unit (Oil/W2) is located near tank 67. The oil/water separators are used to remove oil and solids from wastewater before the water is sent to city sewer.

2.7 Categorically Insignificant Activities (CIA)

Categorically insignificant activities (CIAs) at a facility are not required to be included in the ACDP or the plant site emission limit. A list of CIAs at the facility is provided in form AQ404 in Appendix A.

Emergency Engines

There is one 200-kW Kohler emergency generator at the facility. The emergency generator was installed in 2019 and is fueled with diesel. The generator is used only in the event of a power outage to operate safety and health systems at the plant. For maintenance, the emergency generator is operated for short periods of time to circulate fluids and test performance.

A firewater pump at the facility uses a diesel-fired 209 hp Clarke engine for operation. It was installed in 2019 and only runs for maintenance and to be available for a fire emergency.

For permitting purposes, the emergency engines are a categorically insignificant activity by definition [OAR 340-200-0020(23)(uu)].

Routine Maintenance

Tanks periodically are painted at the terminal as part of tank maintenance. The last time a tank was painted was in 2020 and was performed over a 3 to 4 week period and used about 104 gallons of epoxy and polyurethane coatings.

Welding is performed onsite as needed to maintain equipment, piping, and pipe supports at the terminal. The metal arc welding project for 2021 lasted 2 days and used a total of 30 electrodes (Type 7024).

For permitting purposes, tank painting and welding are a categorically insignificant activity by definition as routine maintenance and repair [OAR 340-200-0020(23)(gg)].

Other Activities

There are other activities, equipment and materials at the terminal that qualify as being categorically insignificant under OAR 340-200-0020(23) and are listed in Appendix A.

Figure 2-1
Zenith Energy Terminal Facility
Process Flow Diagram

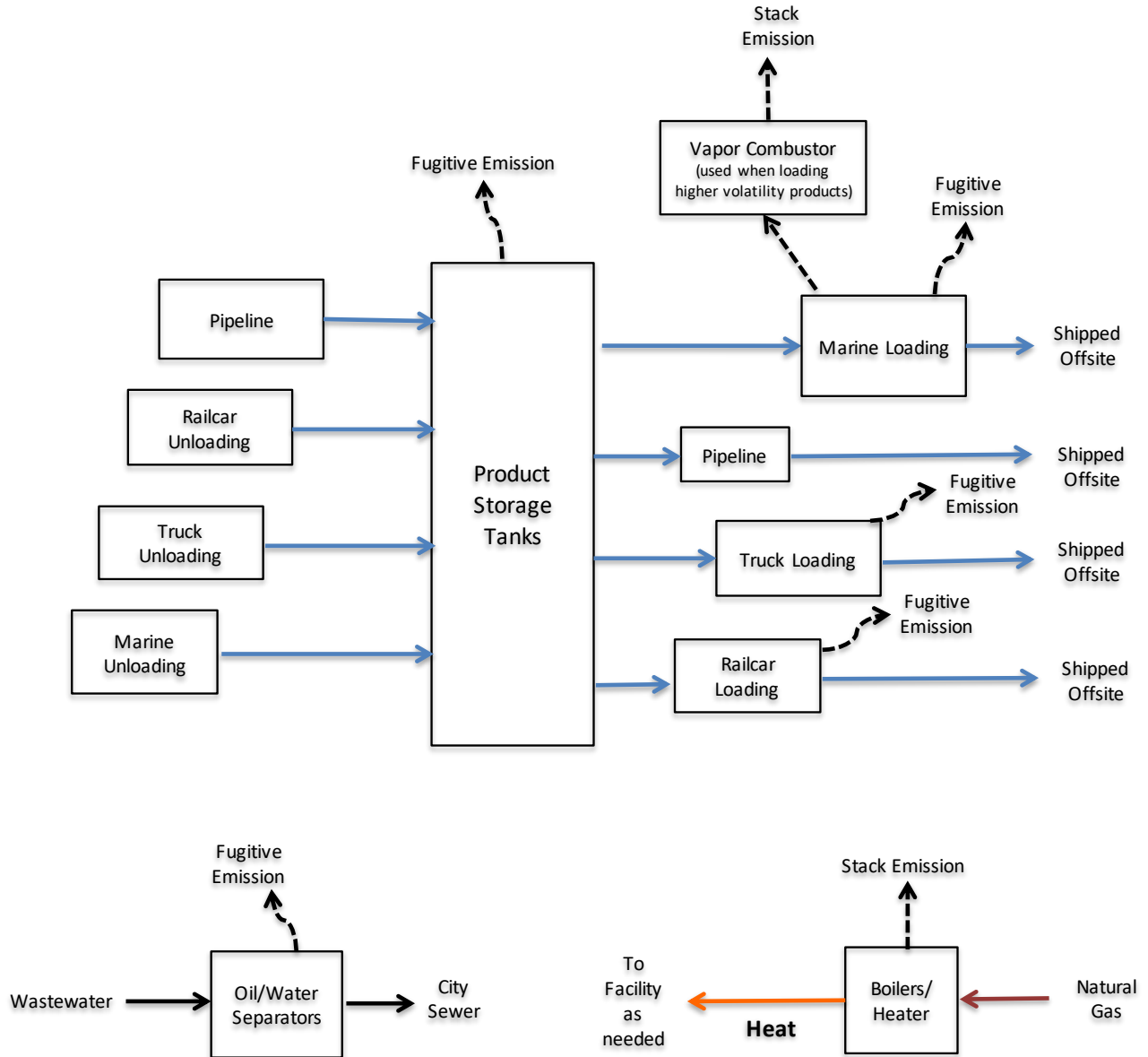
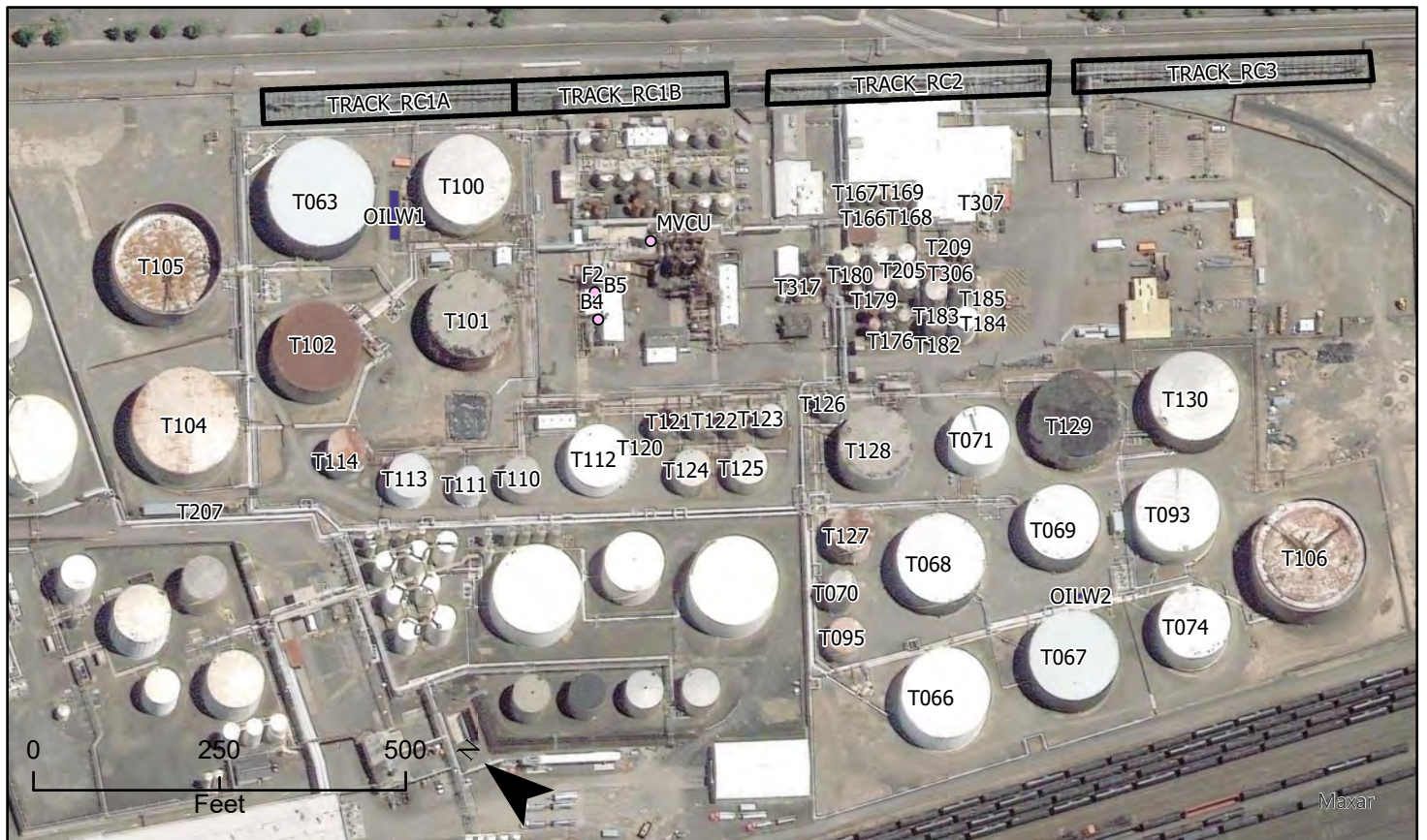
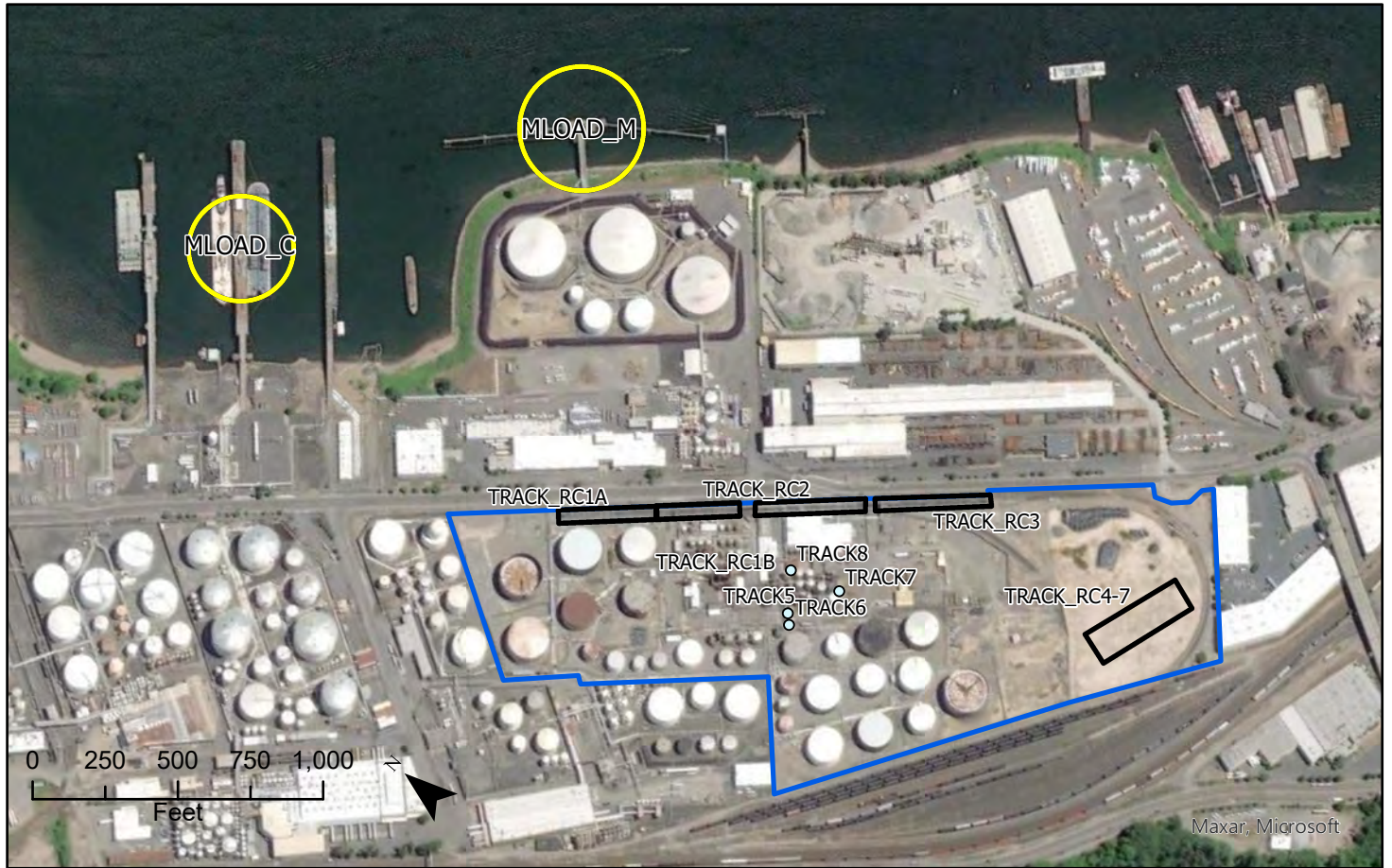


Figure 2-2: Site Layout Plot Plan



3.0 Emissions

3.1 Tank Emissions

Volatile Organic Compound (VOC) Emissions

The primary air emission sources at the terminal are the tanks where products are stored. The tank emission units are defined by the roof type including external floating roof tanks (EXTANK), internal floating roof tanks (INTANK), and fixed roof tanks (FIXTANK).

Emissions for each tank not only depend on the tank design but on the type of product stored, quantity of product put through (throughput) the tank and the storage temperatures. Products with higher volatility have greater emission potential. For purposes of estimating VOC emissions prior to October 3, 2027, Zenith's calculations assumed that the tanks stored these products:

Table 3-1 Products Used in Tank Emission Calculations Prior to Oct. 3, 2027

Product	Tank Type	Tank Numbers
Crude oil	EXTANK	105, 106
Crude oil	INTANK	63, 68, 104, 130
Av-gas	INTANK	71
Distillates	EXTANK	120
Distillates	INTANK	95, 114
Distillates	FIXTANK	All fixed roof tanks in Table 2-2 except 111 & 113 that contain wastewater

For purposes of estimating VOC emissions on and after October 3, 2027, Zenith's calculations assumed that these products were in the tanks:

Table 3-2 Products Used in Tank Emission Calculations Subsequent to Oct. 3, 2027

Product	Tank Type	Tank Numbers
Renewable naphtha	EXTANK	105, 106
Renewable naphtha	INTANK	63, 68, 95, 104, 114, 130
Av-gas	INTANK	71
Distillates	EXTANK	120
Distillates	FIXTANK	All fixed roof tanks in Table 2-2 except 111 & 113 that contain wastewater

As shown in Table 2-1, a wide variety of products could be handled at the terminal. Crude oil (prior to October 3, 2027), ethanol, renewable naphtha, and distillates could be stored in the floating roof tanks. Because emissions are higher for higher volatility products, tank emissions were calculated for crude oil as having a higher vapor pressure than the other products for calculations prior to October 3, 2027 and for renewable naphtha for calculations on and subsequent to October 3, 2027. Tank 71 emissions were calculated using the Av-gas parameters for both time periods.

For the distillates group of products, the characteristics of jet kerosene (a.k.a., Jet A, jet fuel) was used in the emission calculations as a surrogate for distillates. Of the possible products that could be stored, jet kerosene has a higher or equal vapor pressure and should produce a conservative estimate of VOC emissions. Renewable feedstock products are expected to have even lower vapor pressures than the distillates group of products and should have lower VOC emissions.

Overall VOC emissions also depend on the throughput quantities of products being stored and handled at the terminal. The terminal throughput quantities used in the emission calculations are shown in Table 3-3.

Table 3-3 Terminal Throughputs Used in Emission Calculations

Product	Prior to Oct. 3, 2027 (bbl/year)	Subsequent to Oct. 3, 2027 (bbl/year)
Crude oil	8,567,832	0
Av-gas	429,696	429,696
Distillates	10,864,080	13,719,975
Renewable naphtha	--	8,865,396

Tank emissions were calculated using the equations and protocols established by EPA in AP-42, Chapter 7: Liquid Storage Tanks for each month of the year. Annual emissions are the sum of the monthly emissions. Resulting annual VOC emissions for the tanks are:

- Tank VOC emissions Prior to Oct. 3, 2027: 27.32 tons/yr
- Tank VOC emissions On and After Oct. 3, 2027: 26.42 tons/yr

Hazardous Air Pollutant (HAP) Emissions

Hazardous Air Pollutant (HAP) emissions were calculated using the tank VOC emissions and the chemical speciation information for the products used in the VOC calculation. The speciation information came from these safety data sheets (SDS):

- Bakken Crude Oil, Tesoro, 3/7/2018
- Aviation Gasoline, Chevron, 12/7/2015
- Aviation Jet Fuel, Neste, 8/6/2020 (surrogate for distillates products)
- Renewable Naphtha, Neste, 3/25/2022

Copies of the product SDS are provided in Appendix C. The SDS vendor suppliers of these materials may change as different products are handled in the future.

For example, the VOC emissions for crude oil storage tanks were multiplied by the weight percent of each chemical constituent in crude oil to calculate individual HAP emissions from the crude oil tanks. The individual HAP emissions were summed to calculate the combined total HAP emission. The same approach was taken for Av-gas, distillates and renewable naphtha HAP emission estimates.

Crude oil may contain some hydrogen sulfide (H₂S) that could be emitted in the tank vapors. The SDS for crude oil showed a H₂S content of 0 to 0.5% by weight. H₂S emissions were calculated by multiplying 0.5% times the tank VOC emissions resulting in annual emissions of 198 pounds (lb) or 0.1 ton/yr.

The resulting HAP and H₂S emissions from tanks are:

Table 3-4: HAP and H₂S Emissions from Tanks

	Prior to Oct. 3, 2027	Subsequent to Oct. 3, 2027
H ₂ S	0.10 tons/yr	
Combined Total HAPs	7.22 tons/yr	1.41 tons/yr
Largest Single HAP	1.77 tons/yr (toluene)	0.88 ton/yr (hexane)

3.2 Truck and Railcar Loading

Products are unloaded and loaded at the truck and railcar racks but loading operations are what generate air emissions. The emission unit name for truck and railcar loading of products is TRACK. The products to be loaded at the truck and railcar racks are distillates and renewable feedstocks. The quantities of these products expected to be loaded are shown in Table 3-5 and represent the best estimates for use in calculating emissions at this time. Actual quantities and products will vary with market conditions but will be recorded by the terminal.

Table 3-5 Estimated Quantities of Distillates and Renewable Feedstocks Shipped (Loaded) by Mode

Prior to Oct. 3, 2027			Subsequent to Oct. 3, 2027		
Truck (25%)	Rail (10%)	Marine (65%)	Truck (25%)	Rail (10%)	Marine (65%)
2,716,020 bbl/yr	1,086,408 bbl/yr	7,061,652 bbl/yr	3,429,994 bbl/yr	1,371,998 bbl/yr	8,917,984 bbl/yr

Volatile Organic Compound (VOC) Emissions

VOC emissions from product loading into trucks and railcars were estimated using the product loading emission factor equation from AP-42 (Chapter 5.2, Equation 1) and the physical properties of jet kerosene as a surrogate for the other products.

$$\text{VOC EF} = \frac{(12.46 \times S \times P \times M)}{T}$$

VOC EF= VOC Emission factor for loading (lb/1000 gal)= 0.020

S= saturation factor = 0.6 for submerged loading dedicated service

P= true vapor pressure in psi at the loading temperature= 0.011

M= molecular weight of vapor= 130

T= temperature in Rankine = 528 oR

The resulting VOC emissions from truck and rail loading (TRACK) are listed in Table 3-6.

Table 3-6: VOC and HAP Emissions from TRACK Loading

	Prior to Oct. 3, 2027	Subsequent to Oct. 3, 2027
VOC	1.62 tons/yr	2.04 tons/yr
Combined Total HAPs	0.03 tons/yr	0.04 tons/yr
Largest Single HAP	0.02 tons/yr (toluene)	0.02 ton/yr (toluene)

Hazardous Air Pollutant Emissions

HAP emissions from truck and rail loading were calculated using the same methodology as was used to calculate tank HAP emissions. The VOC emissions were multiplied by the chemical speciation information for jet fuel. Emissions for each individual HAP were summed to calculate the combined total HAP emission. The resulting HAP emission totals are shown in Table 3-6.

3.3 Marine Loading

Volatile Organic Compound (VOC) Emissions

Products are unloaded and loaded at both of the marine docks. The emission unit name for marine loading of products is MLOAD with the emissions generated at the Chevron dock (MLOAD-C) and McCall dock (MLOAD-M). The dock locations are shown in Figures 1-1 and 2-2.

Any of the products shipped from the terminal could be loaded into marine vessels (ships or barges). A marine vapor combustion unit (MVCU), located at the terminal, is used to control emissions at the Chevron dock (MLOAD-C) when loading higher volatility products like crude oil and renewable naphtha. When loading marine vessels at the Chevron dock, vapors are captured and are sent to the MVCU. A 99.8% control efficiency is assumed for the MVCU.

The MVCU is not used at either dock when loading distillates, renewable feedstocks or other lower volatility products. Currently only lower volatility products are loaded at the McCall dock (MLOAD-M) as it is not connected to the MVCU. The McCall dock will be connected to the MVCU if higher volatility products are to be loaded at that dock in the future.

Combustion emissions of captured vapors are included in the combustion emission estimates in Section 3.4. The emissions from uncaptured vapors and residual vapors out of the MVCU are included in the MLOAD emission unit.

Emissions were calculated using these product throughput quantities:

Table 3-7 Marine Loading Throughput Estimates

Product	Prior to Oct. 3, 2027 (bbl/year)	Subsequent to Oct. 3, 2027 (bbl/year)
Crude oil	8,567,832	0
Distillates (65% of terminal throughput)	7,061,652	8,917,984
Renewable naphtha	--	8,865,396

Marine loading (MLOAD) VOC emissions were calculated using EPA emission factor equations from AP-42, Section 5.2 “Transportation and Marketing of Petroleum Liquids”; Equation 2 for crude oil loading and Equation 1 for non-crude oil products.

Because the emission factors are different when loading ships versus barges, emissions were calculated assuming 100% of the throughput could be loaded into ships and 100% into barges. The highest VOC emissions from either vessel type are presented in Table 3-8.

Table 3-8: VOC, H₂S and HAP Emissions from Marine Loading

	Prior to Oct. 3, 2027	Subsequent to Oct. 3, 2027
VOC	3.87 tons/yr	4.10 tons/yr
H ₂ S	0.014 tons/yr	
Combined Total HAPs	1.03 tons/yr	0.18 tons/yr
Largest Single HAP	0.23 tons/yr (toluene)	0.11 tons/yr (hexane)

Hazardous Air Pollutant Emissions

HAP and H₂S emissions were calculated using the same methodology and SDS chemical constituent information as were used for tanks and TRACK loading. HAP and H₂S emission estimates are presented in Table 3-8.

3.4 Combustion Emissions

Boilers and Heater

The two boilers (B4 and B5) and heater (F2) use exclusively natural gas fuel. The combustion emissions from these sources were calculated assuming that the burners in each unit were operated at full capacity (48.538 MM Btu/hr total) all year long (8,760 hours/yr). ODEQ emission factors (AQ-EF05) for natural gas combustion sources were used for the criteria pollutant calculations. HAP emission factors were obtained from three references (SCAQMD, Ventura APCD and AP-42 Webfire). Greenhouse gases (GHG) were estimated using EPA composite CO₂, CH₄ and N₂O factors from 40 CFR Part 98. The emission calculation methodology provides a very conservative estimate of maximum potential emissions from these sources. The resulting emission estimates are provided in Table 3-9 and are the same for both the pre- and post-October 3, 2027 emission calculations.

Vapor Combustion

The MVCU uses natural gas to assist in maintaining the temperature. The MVCU has a maximum vapor combustion rating of 80.85 MM Btu/hr. The maximum natural gas heat input rate is 18.36 MM Btu/hr. Typically the MVCU uses a greater amount of assist gas in the first hour of vessel loading to achieve combustion temperatures and then much less for the remainder of loading. On average the MVCU uses 6.53 MM Btu/hr of assist gas for vessel loading.

Vapors from loading are combusted in the MVCU that produce criteria pollutant and GHG emissions. Emission factors for nitrogen oxides (NO_x) and carbon monoxide (CO) from vapor and assist gas combustion were provided by the MVCU vendor. The emission factors for VOC, particulate matter, sulfur dioxide (SO₂), HAPs, and GHG were the same as used for the boilers. Because crude oil has the potential to contain sulfur compounds, an SO₂ emission factor was estimated for combustion of vapors from crude oil.

MVCU combustion emissions are presented in Table 3-9.

Table 3-9 Combustion Emissions

Emissions Prior to Oct. 3, 2027 (tons/yr)					
Pollutant	Boiler B4	Boiler B5	Heater F2	MVCU	Total
NOx	7.19	7.21	6.44	4.76	25.60
CO	6.04	6.06	5.41	6.34	23.85
VOC	0.4	0.4	0.35	0.02	1.16
SO2	0.19	0.19	0.17	0.21	0.75
PM/PM10/PM2.5	0.18	0.18	0.16	0.08	0.60
Combined HAPs	0.01	0.01	0.01	0.004	0.03
GHG (anthropogenic)	8,578	8,609	7,687	4,267	29,141

Emissions Subsequent to Oct. 3, 2027 (tons/yr)					
Pollutant	Boiler B4	Boiler B5	Heater F2	MVCU	Total
NOx	7.19	7.21	6.44	4.92	25.76
CO	6.04	6.06	5.41	6.56	24.07
VOC	0.4	0.4	0.35	0.02	1.16
SO2	0.19	0.19	0.17	0.01	0.55
PM/PM10/PM2.5	0.18	0.18	0.16	0.08	0.60
Combined HAPs	0.01	0.01	0.01	0.004	0.03
GHG (anthropogenic)	8,578	8,609	7,687	578	25,452

3.5 Fugitive Equipment Leak Emissions

There are 12,733 components (pump seals, valves and connectors) used in the piping systems at the terminal. This total does not include components from the refinery piping that are not part of this application but does include an estimate of components for the future manifest railcar racks. The terminal piping components have the potential to leak VOC from the products being conveyed. The emission factors used in the estimates are based on the EPA "Protocol for Equipment Leak Emission Factors", EPA-453/R-95-017, Table 2-3) for terminals. An estimate of the fugitive VOC (FGTVOC) emissions from the piping components is a total of 2.54 tons/yr. This estimate assumes that all of the components are leaking at the emission factor rate all of the time (8760 hours/year).

For the HAP emission estimate, it was assumed that the piping components contain crude oil (prior to Oct. 3, 2027) or renewable naphtha (on or after Oct. 23, 2023). Chemical content information from the SDS for each product were multiplied by the VOC emission estimate to calculate a HAP emission of 0.88 tons/yr for crude oil and 0.13 tons/yr for renewable naphtha.

3.6 Oil/Water Separator Emissions

Emissions from the oil/water separators (Oil/W) were estimated using the VOC emission factor from the existing permit and the maximum volume of wastewater processed through the separators in the last 5 years plus a 50% contingency. Resulting annual VOC emissions from the separators are 2.78 tons/yr for both before and after October 3, 2027. HAP emissions were calculated using the same methodology as was used in calculating HAPs from fugitive equipment leaks.

3.7 Emissions Summary

Summaries of the emissions from the Zenith Energy Terminal Facility are presented in Tables 3-10 and 3-11.

Details of the emission calculations for the terminal will be submitted electronically to ODEQ for review.

The actual quantities of products and types of products handled at the terminal will vary from the quantities in Table 3-3 and used in the emission estimates. Zenith will manage products such that overall emissions from the terminal will stay below the plant site emission limits (PSELs) established in the ACDP. Emissions of SO₂, PM/PM₁₀/PM_{2.5} and H₂S are less than the de minimis thresholds for those pollutants and do not require PSELs to be established.

Based on the emission summaries, Zenith is requesting these PSELs in the ACDP:

VOC: 39 tons/yr
NO_x: 39 tons/yr
CO: 99 tons/yr
GHG: 74,000 tons/yr
Combined HAP: 24 tons/yr
Individual HAP: 9 tons/yr

Table 3-10 Terminal Emissions Summary- Prior to Oct. 3, 2027 (tons/yr)

Source	VOC	NOx	CO	SO2	PM/PM10/ PM2.5	Anthropogenic GHG CO2e	H2S	Combined Total HAPs	Largest Individual* HAP
Tanks (EXTANK/INTANK/FIXTANK)	27.32						0.10	7.22	1.77
Truck & Rail Loading Racks (TRACK)	1.62							0.03	0.02
Marine Loading (MLOAD)	3.87						0.01	1.03	0.23
Fugitive Equipment Leaks (FGTVOC)	2.54						0.01	0.86	0.18
Oil/Water Separators (OIL/W)	2.78							0.94	0.19
Marine VCU (MVCU)	0.02	4.76	6.34	0.21	0.08	4,267		0.004	0.001
Boiler (B4)	0.40	7.19	6.04	0.19	0.18	8,578		0.01	0.003
Boiler (B5)	0.40	7.21	6.06	0.19	0.18	8,609		0.01	0.003
Heater (F2)	0.35	6.44	5.41	0.17	0.16	7,687		0.01	0.002
Facility Total	39.28	25.60	23.85	0.75	0.60	29,141	0.13	10.11	2.40

* Toluene

Table 3-11 Terminal Emissions Summary- On and After Oct. 3, 2027 (tons/yr)

Source	VOC	NOx	CO	SO2	PM/PM10 /PM2.5	Anthropogenic GHG CO2e	Combined Total HAPs	Largest Individual* HAP
Tanks (EXTANK/INTANK/FIXTANK)	26.42						1.41	0.88
Truck & Rail Loading Racks (TRACK)	2.04						0.04	0
Marine Loading (MLOAD)	4.10						0.18	0.11
Fugitive Equipment Leaks (FGTVOC)	2.54						0.13	0.13
Oil/Water Separators (OIL/W)	2.78						0.14	0.14
Marine VCU (MVCU)	0.02	4.92	6.56	0.01	0.08	578	0.004	0.0002
Boiler (B4)	0.40	7.19	6.04	0.19	0.18	8,578	0.01	0.0005
Boiler (B5)	0.40	7.21	6.06	0.19	0.18	8,609	0.01	0.0005
Heater (F2)	0.35	6.44	5.41	0.17	0.16	7,687	0.01	0.0004
Facility Total	39.04	25.76	24.07	0.55	0.60	25,452	1.94	1.26

* Hexane

4.0 Regulatory Review

4.1 New Source Performance Standards

40 CFR Part 60 Subparts Kb- Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984.

The federal new source performance standards (NSPS) for tanks [40 CFR Part 60 Subparts K, Ka or Kb] apply to tanks that store products with a true vapor pressure of greater than 1.5 psia.

The fixed roof tanks (FIXTANK) at the terminal only store products with vapor pressure less than this threshold so these NSPS do not apply to these tanks.

Tanks 68, 71 and 130 were modified after July 23, 1984 and so are subject to NSPS Subpart Kb provisions.

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

The federal NSPS Subpart Dc applies to boilers and indirect heaters with 10 MM Btu/hr or greater heat input and constructed after June 9, 1989. The hot oil loop heater (F2) was constructed in 1946 and has not been subsequently reconstructed or modified so it is not subject to the boiler NSPS. Subpart Dc applies to both boilers (B4 and B5) as they were constructed after June 9, 1989.

40 CFR Part 60, Subpart IIII- Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The NSPS subpart IIII is applicable to the diesel-fired emergency generator and fire pump engine both installed in 2019.

4.2 National Emission Standards for Hazardous Air Pollutants

40 CFR 63 Subpart BBBB (6B) – National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Distribution Bulk Terminals, Bulk Plants and Pipeline Facilities

Zenith Terminal Facility is subject to NESHAP 6B is applicable because Tank 71 stores aviation gasoline and the daily throughput is greater than 20,000 gallons/day. The aviation gasoline stored in Tank 71 meets the 40 CFR 63.11100 definition of gasoline and the maximum aviation gasoline design throughput (71,000 gallons per day) meets the 40 CFR 63.11100 definition of a bulk gasoline terminal. Monthly leak inspections are required for all equipment in gasoline service as specified in 40 CFR §63.11089(a). The applicability to 6B does not trigger the requirement for the facility to obtain a Title V permit as it is a minor source of HAPs and criteria pollutants [40 CFR §63.11081(b)].

40 CFR Part 63, Subpart JJJJJJ- National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers at Area Sources

Natural gas-fired boilers are not subject to this rule [40 CFR §63.11195(c)]. This boiler NESHAP does not apply to the boilers at the terminal because they fire exclusively natural gas.

40 CFR Part 63, Subpart ZZZZ- National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

NESHAP subpart ZZZZ is applicable to the emergency generator and fire pump engine. Because the engines are subject to NSPS subpart IIII, compliance with the NSPS shows compliance with the Subpart ZZZZ NESHAP [40 CFR §63.6590(e)].

4.3 Oregon Requirements

The facility will have to comply with the air quality regulations in the Oregon Administrative Rules (OAR). Following is a brief discussion of the main rules with emission limits that were specifically reviewed for the terminal.

OAR Division 208: Visible Emissions and Nuisance Requirements

The following rules in this division apply to the terminal:

- -0110: Limits on visible emissions
- -0210: Requirements for fugitive emissions
- -0300: Nuisance control requirements for odor and dust fallout
- -0450: Prevent deposition of 250 micron particulate matter
- -0500-0610: Odor, ships and particulate weight requirements for sources in Multnomah County

OAR Division 226: General Emission Standards

The grain loading emission limit in 340-226-0210(2)(c) applies to the marine vapor combustion unit (MVCU) at the terminal.

OAR Division 228: Fuel Burning Equipment

This rule has emission limits that apply to boilers and heater and limits on the sulfur content of fuel burned. These requirements apply to the boilers and heater at the terminal.

OAR Division 232: Emission Standards of VOC Point Sources

This division of the air quality regulations apply to several categories of sources with emissions of VOC. Two of the categories address the loading organic liquids into marine vessels and the storage of VOC liquid, including:

- OAR 340-232-0110: There are emission limits and control requirements on the loading of gasoline or volatile organic liquids into marine vessels. These requirements apply to the loading of crude oil and renewable naphtha into marine vessels and are applicable to the terminal.
- OAR 340-232-0150: This rule applies to storing methanol or other VOC liquids with a true vapor pressure greater than 1.5 psia [OAR 340-232-0150(1)]. The floating roof tanks at the terminal are subject to the seal requirements specified in this rule.

Demonstrations must be made that the fixed roof tanks store products of less than 1.5 psia to show that this rule does not apply.

OAR Division 245: Cleaner Air Oregon

This division of the air quality regulations requires all permitted sources to periodically submit Toxic Air Contaminant (TAC) inventories. For existing sources (those that commenced construction before November 16, 2018), the requirement is to submit a periodic TAC inventory no later than 60 days after the date that ODEQ sends a written request [OAR 340-245-0040(2)(b)]. In addition, ODEQ may require that certain existing sources submit a TAC emissions inventory for purposes of conducting a risk assessment. These emissions inventories must be submitted consistent with the requirements of OAR 340-245-0030.

The Zenith Energy Terminal Facility was constructed prior to November 16, 2018 and so is an existing source subject to the periodic TAC emissions inventory requirement. TAC emissions for the combined refinery and terminal were quantified as part of the triennial process and the combined facility was ranked by ODEQ as a “Group 3” facility. Zenith will submit a TAC emissions inventory specific to the terminal at the earlier of ODEQ’s request or the time of the next triennial submittal.

Appendix A- ACDP Forms

- AQ101- Administrative Form
- AQ102- Facility Description
- AQ205 VOC Storage Tanks
- AQ208 Boilers
- AQ213 Power Supply Generators
- AQ230 Truck and Rail Car Racks
- AQ230 Marine Loading
- AQ230 Oil/Water Separators
- AQ306 Fume Incinerator (Marine VCU)
- AQ402 Current/Future Emissions
- AQ403 HAP Emissions
- AQ404 CIA

DEQ USE ONLY	
Permit Number:	Type of Application:
Application No:	RNW _____ MOD _____ NEW _____
Date Received :	
Regional Office:	Check No. Amount \$

1. Company			2. Facility Location		
Legal Name: Zenith Energy Terminals Holdings LLC			Name: Zenith Energy Terminal Facility		
Mailing Address: 5501 Northwest Front Avenue			Street Address: 5501 Northwest Front Avenue		
City: Portland	State: OR	Zip Code: 97210	City: Portland	County: Multnomah	Zip Code: 97210
Number of employees (Corporate):		195	Number of employees (Facility):		17
3. Industrial Classification Code(s)			4. Other DEQ Permits		
Primary SIC SIC 4226, NAICS 493190 and NAICS:			Title V Operating Permit 26-2025, 1200-Z and 1200-C Stormwater Permits		
Secondary SIC and NAICS:			5. LUCS: <input type="checkbox"/> New facility <input checked="" type="checkbox"/> Modified facility Tax Lot #: 400, 500, 1500		

6. Permit Action:

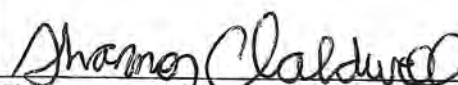
- Short Term Activity ACDP
- New Simple ACDP with short-term NAAQS analysis
- Construction ACDP with short-term NAAQS analysis, if applicable
- New Standard ACDP with short-term NAAQS analysis
- New or modified Standard ACDP (PSD/NSR) with short-term NAAQS analysis
- Renewal of an existing permit without changes (include form AQ403 for Standard ACDPs)
- Renewal of an existing permit with changes (include any other necessary forms and form AQ403 for Standard ACDPs)
- Modification of existing permit

7. Signature

I hereby apply for permission to discharge air contaminants in the State of Oregon, as stated or described in this application, and certify that the information contained in this application and the schedules and exhibits appended hereto, are true and correct to the best of my knowledge and belief.

Shannon Caldwell

 Name of official (Printed or Typed)



 Signature of official

Vice President, HSE and Regulatory

 Title of official and phone number

11/08/2022

 Date

Fee Information
 (Make check payable to DEQ)

Note: The initial application fees and annual fees specified below (OAR 340-216-8020, Table 2, Parts 1, 2 and 3) are only required for initial permit applications. These fees are not required for an application to renew or modify an existing permit. The appropriate specific activity fee(s) specified below (OAR 340-216-8020, Table 2, and Part 4) applies to permit modifications or may be in addition to initial permit application fees.

OAR 340-216-8020, Table 2, Part 1 – Initial Permitting Application Fees:		
Short Term Activity ACDP	<input type="checkbox"/>	\$4,500.00
Simple ACDP	<input type="checkbox"/>	\$9,000.00
Construction ACDP	<input type="checkbox"/>	\$14,400.00
Standard ACDP	<input checked="" type="checkbox"/>	\$18,000.00
Standard ACDP (Major NSR or Type A State NSR)	<input type="checkbox"/>	\$63,000.00
OAR 340-216-8020, Table 2, Part 2 – Annual Fees:		
Simple ACDP – Low fee class	<input type="checkbox"/>	\$3,917.00
Simple ACDP – High fee class	<input type="checkbox"/>	\$7,834.00
Standard ACDP	<input checked="" type="checkbox"/>	\$15,759.00
OAR 340-216-8020, Table 2, Part 3 – Cleaner Air Oregon Annual Fees:		
Simple ACDP - Low fee class	<input type="checkbox"/>	\$806.00
Simple ACDP - High fee class	<input type="checkbox"/>	\$1,612.00
Standard ACDP	<input type="checkbox"/>	\$3,225.00
OAR 340-216-8020, Table 2, Part 4 – Specific Activity Fees:		
Non-Technical Permit Modification	<input type="checkbox"/>	\$432.00
Basic Technical Permit Modification	<input type="checkbox"/>	\$540.00
Simple Technical Permit Modification	<input type="checkbox"/>	\$1,800.00
Moderate Technical Permit Modification	<input type="checkbox"/>	\$9,000.00
Complex Technical Permit Modification	<input type="checkbox"/>	\$18,000.00
Major NSR or type A State NSR Permit Modification	<input type="checkbox"/>	\$63,000.00
Modeling review (outside Major NSR or type A State NSR)	<input type="checkbox"/>	\$9,000.00
Public Hearing at Source's Request	<input type="checkbox"/>	\$3,600.00
State MACT determination	<input type="checkbox"/>	\$9,000.00
Compliance Order Monitoring	<input type="checkbox"/>	\$180.00/month
Total Fees:		\$ 33,759.00

1. Company Information:

Legal Name: Zenith Energy Terminals Holdings LLC	Other company name (if different than legal name):
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2. Site Contact Person:

(A person who deals with DEQ staff about equipment problems.)

Name: Clay Reese	Telephone number: 503-273-4720	Fax:
Title: HSER Manager-Portland	Email address: Clay.Reese@zenithterminals.com	
Mailing address: 5501 NW Front Avenue	City, State, Zip Code Portland, OR 97210	

3. Facility Contact Person:

(If other than the site contact person, a person involved with all environmental issues at the facility although they may be housed at a different site.)

Name: Shannon Caldwell	Telephone number: 713-395-6231	Fax:
Title: Vice President of HSE and Regulatory	Email address: Shannon.Caldwell@zenithterminals.com	
Mailing address: 3900 Essex Lane Suite 700	City, State, Zip Code Houston, Texas 77027	

4. Mailing Contact Person:

(If other than the site contact person, a person to whom the company would like all agency communications directed.)

Name: site contact	Telephone number:	Fax:
Title:	Email address:	
Mailing address:	City, State, Zip Code	

5. Invoice Contact Person:

(If other than the site contact person, a contact to which invoices and communications related to resolving invoice questions can be directed.)

Name: Facility Contact	Telephone number:	Fax:
Title:	Email address:	
Mailing address:	City, State, Zip Code	

Submit TWO copies of the completed application to the appropriate address below and email a convenience copy to:

New or Modified Permits (include fees)

Oregon Department of Environmental Quality
Financial Services – Revenue Section
700 NE Multnomah St., Suite 600
Portland, OR 97232-4100

Permit Renewals (no fees)

Oregon Department of Environmental Quality



State of Oregon
Department of
Environmental
Quality

Facility Description

Form AQ102
Answer Sheet

Facility Name: Zenith Energy Terminal Facility Permit Number: TBD

1. Description of facility and processes:

See Chapters 1 and 2 of the ACDP application.

2. Attach plot plan. See Figure 2-2
3. Attach process flow diagram. See Figure 2-1
4. Attach a city map or drawing showing the facility location. See Figure 1-1



State of Oregon
Department of
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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	63	66	67	68
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1941	1/1947	1/1947	1/1947
4. Date installed (month/year)	7/1941	7/1947	7/1947	7/1947
5. Rated capacity (gallons)	5481882	3383856	3383856	3405654
6. Height (feet)	45	40	40	39.1
7. Diameter (feet)	144	120	120	120
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fix. roof/int. float	Fixed roof	Fixed roof	Fix. roof/int. float
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	16	12	12	12
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	No	Yes	Yes	No
If yes, enter psia.		±0.03 psi	±0.03 psi	
14. Fixed roof tank? (yes or no)	No	Yes	Yes	No
a. roof color	N/A	White	White	N/A



State of Oregon
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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	63	66	67	68
b. shell color	N/A	White	White	N/A
c. vapor space height (feet)	N/A	20	20	N/A
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	Yes	No	No	Yes
a. type of construction	Welded	Welded	Welded	Welded
b. condition	light rust	light rust	light rust	light rust
c. tank color	White	N/A	N/A	White
d. deck type	Welded	N/A	N/A	Welded
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	Liquid primary	N/A	N/A	Liquid primary
b. number of columns	9	N/A	N/A	7
c. effective column diameter (feet)	1.1	N/A	N/A	1.1
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				X
(2) unbolted cover, gasketed	X			
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed	X			X
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed	X			X



State of Oregon
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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	63	66	67	68
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed	X			X
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed	X			X
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable	X			X
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed	X			X
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	168,000	Unknown	210,000	168,000
19. Description of submerged fill out-loading	Marine	Marine, rail, and truck	Marine, rail, and truck	Marine
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

State of Oregon
Department of
Environmental
Quality

	Tank Identification Number			
	63	66	67	68
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



State of Oregon
Department of
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Quality

**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	69	70	71	74
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1951	1/1950	1/1951	1/1959
4. Date installed (month/year)	7/1951	7/1950	7/1951	7/1959
5. Rated capacity (gallons)	2363970	366072	1503936	2165688
6. Height (feet)	40	48.33	40	40
7. Diameter (feet)	100	36	80	96
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fix. roof/int. float	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	12	8	8	8
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	No	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	N/A	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	No
a. roof color	White	Insulated	N/A	Insulated



State of Oregon
Department of
Environmental
Quality

**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	69	70	71	74
b. shell color	White	Insulated	N/A	Insulated
c. vapor space height (feet)	20	24.2	N/A	20
d. shell condition	light rust	light rust	N/A	light rust
15. Floating roof tank? (yes or no)	No	No	Yes	No
a. type of construction	N/A	N/A	Welded	N/A
b. condition	light rust	light rust	light rust	light rust
c. tank color	N/A	N/A	White	N/A
d. deck type	N/A	N/A	Welded	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	Liquid prima	N/A
b. number of columns	N/A	N/A	1	N/A
c. effective column diameter (feet)	N/A	N/A	1.1	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed			X	
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed			X	
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed			X	



State of Oregon
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Quality

**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	69	70	71	74
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed			X	
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket			X	
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable			X	
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed			X	
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	210,000	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine and pipeline	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	69	70	71	74
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	93	95	100	101
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1963	1/1965	1/1947	1/1947
4. Date installed (month/year)	7/1963	7/1965	7/1947	7/1947
5. Rated capacity (gallons)	2984562	406056	3383856	3383856
6. Height (feet)	40.5	30	40	40
7. Diameter (feet)	112	48	120	120
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fix. roof/int. float	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	8	8	12	12
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	No	Yes	Yes
If yes, enter psia.	±0.03 psi	N/A	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	No	Yes	Yes
a. roof color	Insulated	N/A	Gray-Medium	Gray-Medium



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	93	95	100	101
b. shell color	Insulated	N/A	Gray-Medium	Gray-Medium
c. vapor space height (feet)	20.25	N/A	20	20
d. shell condition	light rust	N/A	light rust	light rust
15. Floating roof tank? (yes or no)	No	Yes	No	No
a. type of construction	N/A	Welded	N/A	N/A
b. condition	light rust	light rust	light rust	light rust
c. tank color	N/A	White	White	N/A
d. deck type	N/A	Welded	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	Liquid primary	N/A	N/A
b. number of columns	N/A	1	N/A	N/A
c. effective column diameter (feet)	N/A	1.1	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed		X		
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed		X		
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	93	95	100	101
(2) built up column, sliding cover, ungasketed		X		
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed		X		
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed		X		
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable		X		
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed		X		
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

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	Tank Identification Number			
	93	95	100	101
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	102	104	105	106
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1948	1/1957	1/1975	1/1980
4. Date installed (month/year)	7/1948	7/1957	7/1975	7/1980
5. Rated capacity (gallons)	3383856	5603682	5767566	6344772
6. Height (feet)	40	46	48	48
7. Diameter (feet)	120	144	144	150
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fix. roof/int. float	Ext. float roof	Ext. float roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	12	12	12	10
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	No	No	No
If yes, enter psia.	±0.03 psi	N/A	N/A	N/A
14. Fixed roof tank? (yes or no)	Yes	No	No	No
a. roof color	Gray-Medium	N/A	N/A	N/A



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VOC-CONTAINING PRODUCT
STORAGE TANK

FORM AQ205
ANSWER SHEET

	Tank Identification Number			
	102	104	105	106
b. shell color	Gray-Medium	N/A	N/A	N/A
c. vapor space height (feet)	20	N/A	N/A	N/A
d. shell condition	light rust	N/A	N/A	N/A
15. Floating roof tank? (yes or no)	No	Yes	Yes	Yes
a. type of construction	N/A	Welded	Welded	Welded
b. condition	light rust	light rust	light rust	light rust
c. tank color	N/A	White	White	White
d. deck type	N/A	Welded	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	Shoe primary	Shoe primary
17. Internal floating roof tanks				
a. seal type	N/A	Liquid primary	N/A	N/A
b. number of columns	N/A	9	N/A	N/A
c. effective column diameter (feet)	N/A	1.1	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed			X	X
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed		X		
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed			X	X
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed		X		
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	102	104	105	106
(2) built up column, sliding cover, ungasketed		X		
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed		X		
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed		X		
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable		X	X	X
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed			X	X
(2) weighted mechanical actuation, ungasketed		X		
18. Maximum liquid loading rate (gallons/hour)	Unknown	168,000	168,000	168,000
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine	Marine	Marine
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	102	104	105	106
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	110	111	112	113
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1947	1/1947	1/1947	1/1947
4. Date installed (month/year)	7/1947	7/1947	7/1947	7/1947
5. Rated capacity (gallons)	466998	300804	1326486	657846
6. Height (feet)	32	32	32	32
7. Diameter (feet)	50	40	84	60
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	4	4	8	4
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	No	No	No	No
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	Insulated	White	White	White



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	110	111	112	113
b. shell color	Insulated	White	White	Gray-Light
c. vapor space height (feet)	16	16	16	16
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	N/A	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	110	111	112	113
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	210,000	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck		Marine, rail, and truck	
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank		Wastewater		Wastewater
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
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	Tank Identification Number			
	110	111	112	113
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	114	127	128	129
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1947	1/1965	1/1952	1/1966
4. Date installed (month/year)	7/1947	7/1965	7/1952	7/1966
5. Rated capacity (gallons)	635418	845964	2349900	3383856
6. Height (feet)	40	40	40	40
7. Diameter (feet)	52	60	100	120
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fix. roof/int. float	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	4	6	4	12
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	No	Yes	Yes	Yes
If yes, enter psia.	N/A	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	No	Yes	Yes	Yes
a. roof color	N/A	Insulated	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	114	127	128	129
b. shell color	N/A	Insulated	Insulated	Insulated
c. vapor space height (feet)	Insulated	20	20	20
d. shell condition	N/A	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	Yes	No	No	No
a. type of construction	Welded	N/A	N/A	N/A
b. condition	light rust	N/A	N/A	N/A
c. tank color	White	N/A	N/A	N/A
d. deck type	Welded	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	Liquid primary	N/A	N/A	N/A
b. number of columns	1	N/A	N/A	N/A
c. effective column diameter (feet)	1.1	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed	X			
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed	X			
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

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ANSWER SHEET**

		Tank Identification Number			
		114	127	128	129
(2)	built up column, sliding cover, ungasketed	X			
(3)	pipe column, flexible fabric sleeve seal				
(4)	pipe column, sliding cover, gasketed				
(5)	pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well					
(1)	sliding cover, gasketed				
(2)	sliding cover, ungasketed	X			
e.v deck fitting types – sample well or pipe					
(1)	slotted pipe, sliding cover, gasket				
(2)	slotted pipe, sliding cover, ungasketed	X			
(3)	sample well, slit fabric seal, 10% open area				
(4)	stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well					
(1)	adjustable	X			
(2)	fix				
e.vii deck fitting types – vacuum breaker					
(1)	weighted mechanical actuation, gasketed				
(2)	weighted mechanical actuation, ungasketed	X			
18.	Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19.	Description of submerged fill out-loading	Marine	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20.	Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21.	Name/type of material stored in the tank				
22.	Maximum projected throughput (gallons/year)				
23.	Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

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	Tank Identification Number			
	114	127	128	129
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	120	121	122	123
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1946	1/1947	1/1947	1/1946
4. Date installed (month/year)	7/1946	7/1947	7/1947	7/1946
5. Rated capacity (gallons)	192486	192486	192486	192486
6. Height (feet)	32	32	32	32
7. Diameter (feet)	32	32	32	32
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Ext. float roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	4	4	4	3
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	No	Yes	Yes	Yes
If yes, enter psia.	N/A	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	No	Yes	Yes	Yes
a. roof color	N/A	Gray-Light	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

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ANSWER SHEET**

	Tank Identification Number			
	120	121	122	123
b. shell color	N/A	Gray-Light	Insulated	Insulated
c. vapor space height (feet)	N/A	16	16	16
d. shell condition	N/A	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	Yes	No	No	No
a. type of construction	Welded	N/A	N/A	N/A
b. condition	light rust	N/A	N/A	N/A
c. tank color	White	N/A	N/A	N/A
d. deck type	Welded	N/A	N/A	N/A
16. External floating roof tank seal type	Shoe primary	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	0	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed	X			
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed	X			
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	120	121	122	123
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable	X			
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed	X			
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	120	121	122	123
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	124	125	126	170
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1946	1/1947	1/1939	1/1998
4. Date installed (month/year)	7/1946	7/1947	7/1939	7/1998
5. Rated capacity (gallons)	469980	469980	189000	135366
6. Height (feet)	32	32	35	40
7. Diameter (feet)	50	50	30	24
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	4	4	6	3
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	Insulated	Insulated	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	124	125	126	170
b. shell color	Insulated	Insulated	Insulated	Insulated
c. vapor space height (feet)	16	16	17.5	20
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	N/A	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	124	125	126	170
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



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**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	124	125	126	170
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	130	166	167	168
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1967	1/1949	1/1949	1/1949
4. Date installed (month/year)	7/1967	7/1949	7/1949	7/1949
5. Rated capacity (gallons)	3383856	39648	39648	39648
6. Height (feet)	40	30	30	30
7. Diameter (feet)	120	15	15	15
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fix. roof/int. float	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	12	6	6	6
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	No	Yes	Yes	Yes
If yes, enter psia.	N/A	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	No	Yes	Yes	Yes
a. roof color	N/A	Insulated	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	130	166	167	168
b. shell color	N/A	Insulated	Insulated	Insulated
c. vapor space height (feet)	N/A	15	15	15
d. shell condition	N/A	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	Yes	No	No	No
a. type of construction	Welded	N/A	N/A	N/A
b. condition	light rust	N/A	N/A	N/A
c. tank color	White	N/A	N/A	N/A
d. deck type	Welded	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	Liquid primary	N/A	N/A	N/A
b. number of columns	7	N/A	N/A	N/A
c. effective column diameter (feet)	1.1	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed	X			
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed	X			
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed	X			



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	130	166	167	168
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed	X			
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket	X			
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable	X			
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed	X			
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	168,000	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



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**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	130	166	167	168
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	169	182	183	184
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1949	1/1970	1/1973	1/1975
4. Date installed (month/year)	7/1949	7/1970	7/1973	7/1975
5. Rated capacity (gallons)	23772	222180	222180	222054
6. Height (feet)	18	42	42	42
7. Diameter (feet)	15	30	30	30
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	6	6	6	6
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	Insulated	Gray-Light	Gray-Light	Gray-Light



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	169	182	183	184
b. shell color	Insulated	Gray-Light	Gray-Light	Gray-Light
c. vapor space height (feet)	9	21	21	21
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	Welded	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	169	182	183	184
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	169	182	183	184
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	171	172	173	174
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1949	1/1949	1/1951	1/1951
4. Date installed (month/year)	7/1949	7/1949	7/1951	7/1951
5. Rated capacity (gallons)	135366	135366	135366	135366
6. Height (feet)	40	40	40	40
7. Diameter (feet)	24	24	24	24
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	3	3	3	3
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	Insulated	Insulated	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	171	172	173	174
b. shell color	Insulated	Insulated	Insulated	Insulated
c. vapor space height (feet)	20	20	20	20
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	N/A	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	171	172	173	174
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



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**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	171	172	173	174
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	179	180	202	203
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1961	1/1961	1/1968	1/1973
4. Date installed (month/year)	7/1961	7/1961	7/1968	7/1973
5. Rated capacity (gallons)	19446	19446	11760	20370
6. Height (feet)	30	30	20	24
7. Diameter (feet)	10.5	10.5	10	12
8. Submerged fill pipe? (yes or no)	No	No	No	3
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	3	3	3	3
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	White	White	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	179	180	202	203
b. shell color	White	White	Insulated	Insulated
c. vapor space height (feet)	15	15	10	12
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	N/A	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	179	180	202	203
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	179	180	202	203
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	185			
1. Existing or future?	Existing			
2. Manufacturer	Unknown			
3. Date construction commenced (month/year)	1/1975			
4. Date installed (month/year)	7/1975			
5. Rated capacity (gallons)	222054			
6. Height (feet)	42			
7. Diameter (feet)	30			
8. Submerged fill pipe? (yes or no)	No			
9. Type of tank	Fixed roof			
10. Underground? (yes or no)	No			
Underground tank fill type				
11. Above ground? (yes or no)	Yes			
a. Pipe material	Steel			
b. Pipe size	6			
c. Piping continuously drains downward? (yes or no)	No			
d. Description of condensate collection tank.	N/A			
e. Isolation valves? (yes or no)	Yes			
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A			
b. months	N/A			
13. Pressure conservation vent? (yes or no)	Yes			
If yes, enter psia.	±0.03 psi			
14. Fixed roof tank? (yes or no)	Yes			
a. roof color	Gray-Light			



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	185			
b. shell color	Gray-Light			
c. vapor space height (feet)	21			
d. shell condition	light rust			
15. Floating roof tank? (yes or no)	No			
a. type of construction	N/A			
b. condition	N/A			
c. tank color	N/A			
d. deck type	N/A			
16. External floating roof tank seal type	N/A			
17. Internal floating roof tanks				
a. seal type	N/A			
b. number of columns	N/A			
c. effective column diameter (feet)	N/A			
d. total deck seam length (feet)	N/A			
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	185			
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown			
19. Description of submerged fill out-loading	Marine, rail, and truck			
20. Vapor recovery system? (yes or no)	No			

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



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**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	185			
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	204	205	207	208
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1969	1/1969	1/1972	1/1972
4. Date installed (month/year)	7/1969	7/1969	7/1972	7/1972
5. Rated capacity (gallons)	20286	20286	11760	11760
6. Height (feet)	24	24	20	20
7. Diameter (feet)	12	12	10	10
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	4	2	2	3
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	Insulated	Insulated	Insulated	Insulated



**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	204	205	207	208
b. shell color	Insulated	Insulated	Insulated	Insulated
c. vapor space height (feet)	12	12	10	10
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	N/A	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	204	205	207	208
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

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	Tank Identification Number			
	204	205	207	208
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	209	211	213	306
1. Existing or future?	Existing	Existing	Existing	Existing
2. Manufacturer	Unknown	Unknown	Unknown	Unknown
3. Date construction commenced (month/year)	1/1974	1/1976	1/1995	1/1982
4. Date installed (month/year)	7/1974	7/1976	7/1995	7/1982
5. Rated capacity (gallons)	17052	21000	12936	2940
6. Height (feet)	24	24	20	13
7. Diameter (feet)	11	12	10.5	6
8. Submerged fill pipe? (yes or no)	No	No	No	No
9. Type of tank	Fixed roof	Fixed roof	Fixed roof	Fixed roof
10. Underground? (yes or no)	No	No	No	No
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes	Yes	Yes
a. Pipe material	Steel	Steel	Steel	Steel
b. Pipe size	3	3	3	3
c. Piping continuously drains downward? (yes or no)	No	No	No	No
d. Description of condensate collection tank.	N/A	N/A	N/A	N/A
e. Isolation valves? (yes or no)	Yes	Yes	Yes	Yes
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A	N/A	N/A
b. months	N/A	N/A	N/A	N/A
13. Pressure conservation vent? (yes or no)	Yes	Yes	Yes	Yes
If yes, enter psia.	±0.03 psi	±0.03 psi	±0.03 psi	±0.03 psi
14. Fixed roof tank? (yes or no)	Yes	Yes	Yes	Yes
a. roof color	Insulated	Insulated	Insulated	Insulated



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	209	211	213	306
b. shell color	Insulated	Insulated	Insulated	Insulated
c. vapor space height (feet)	12	12	10	6.5
d. shell condition	light rust	light rust	light rust	light rust
15. Floating roof tank? (yes or no)	No	No	No	No
a. type of construction	N/A	N/A	N/A	N/A
b. condition	N/A	N/A	N/A	N/A
c. tank color	N/A	N/A	N/A	N/A
d. deck type	N/A	N/A	N/A	N/A
16. External floating roof tank seal type	N/A	N/A	N/A	N/A
17. Internal floating roof tanks				
a. seal type	N/A	N/A	N/A	N/A
b. number of columns	N/A	N/A	N/A	N/A
c. effective column diameter (feet)	N/A	N/A	N/A	N/A
d. total deck seam length (feet)	N/A	N/A	N/A	N/A
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	209	211	213	306
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown	Unknown	Unknown
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck	Marine, rail, and truck
20. Vapor recovery system? (yes or no)	No	No	No	No

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



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**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	209	211	213	306
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

Tank Information:

	Tank Identification Number			
	307	317		
1. Existing or future?	Existing	Existing		
2. Manufacturer	Unknown	Unknown		
3. Date construction commenced (month/year)	1/1996	1/1999		
4. Date installed (month/year)	7/1996	7/1999		
5. Rated capacity (gallons)	3570	10500		
6. Height (feet)	9	17.5		
7. Diameter (feet)	7	10		
8. Submerged fill pipe? (yes or no)	No	No		
9. Type of tank	Fixed roof	Fixed roof		
10. Underground? (yes or no)	No	No		
Underground tank fill type				
11. Above ground? (yes or no)	Yes	Yes		
a. Pipe material	Steel	Steel		
b. Pipe size	2	3		
c. Piping continuously drains downward? (yes or no)	No	No		
d. Description of condensate collection tank.	N/A	N/A		
e. Isolation valves? (yes or no)	Yes	Yes		
12. Pressure/vacuum relief valves				
a. vent pressure settings (psia)	N/A	N/A		
b. months	N/A	N/A		
13. Pressure conservation vent? (yes or no)	Yes	Yes		
If yes, enter psia.	±0.03 psi	±0.03 psi		
14. Fixed roof tank? (yes or no)	Yes	Yes		
a. roof color	Insulated	Insulated		



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	307	317		
b. shell color	Insulated	Insulated		
c. vapor space height (feet)	4.5	8.75		
d. shell condition	light rust	light rust		
15. Floating roof tank? (yes or no)	No	No		
a. type of construction	N/A	N/A		
b. condition	N/A	N/A		
c. tank color	N/A	N/A		
d. deck type	N/A	N/A		
16. External floating roof tank seal type	N/A	N/A		
17. Internal floating roof tanks				
a. seal type	N/A	N/A		
b. number of columns	N/A	N/A		
c. effective column diameter (feet)	N/A	N/A		
d. total deck seam length (feet)	N/A	N/A		
e.i deck fitting types – access hatch				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.ii deck fitting types – automatic gauge float well				
(1) bolted cover, gasketed				
(2) unbolted cover, gasketed				
(3) unbolted cover, ungasketed				
e.iii deck fitting types – column well				
(1) built-up column, sliding cover, gasketed				



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**VOC-CONTAINING PRODUCT
STORAGE TANK**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	307	317		
(2) built up column, sliding cover, ungasketed				
(3) pipe column, flexible fabric sleeve seal				
(4) pipe column, sliding cover, gasketed				
(5) pipe column, sliding cover, ungasketed				
e.iv deck fitting types – ladder well				
(1) sliding cover, gasketed				
(2) sliding cover, ungasketed				
e.v deck fitting types – sample well or pipe				
(1) slotted pipe, sliding cover, gasket				
(2) slotted pipe, sliding cover, ungasketed				
(3) sample well, slit fabric seal, 10% open area				
(4) stub drain, 1-inch diameter				
e.vi deck fitting types – roof leg or hanger well				
(1) adjustable				
(2) fix				
e.vii deck fitting types – vacuum breaker				
(1) weighted mechanical actuation, gasketed				
(2) weighted mechanical actuation, ungasketed				
18. Maximum liquid loading rate (gallons/hour)	Unknown	Unknown		
19. Description of submerged fill out-loading	Marine, rail, and truck	Marine, rail, and truck		
20. Vapor recovery system? (yes or no)	No	No		

Material Stored:

21. Name/type of material stored in the tank				
22. Maximum projected throughput (gallons/year)				
23. Maximum projected turnovers per year				



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**VOC-CONTAINING PRODUCT
STORAGE TANK INFORMATION**

**FORM AQ205
ANSWER SHEET**

	Tank Identification Number			
	307	317		
24. Density (pounds/gallon)				
25. Molecular weight				
26. Average storage temperature (°F)				
27. Vapor pressure (psia)				



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BOILERS

**FORM AQ208
ANSWER SHEET**

Facility Name: **Zenith Energy Terminal Facility** Permit Number: **Pending**

1. Boiler Information:				
Boiler identification	B4	B5	F2	
Manufacturer	Cleaver Brooks	Johnston		
Date manufactured (month/year)	1/1990	1/1996	1/1946	
Date construction commenced (month/year)	6/1990	6/1996	6/1946	
Date installed (month/year)	7/1990	7/1996	7/1946	
Rated design heat input capacity (million Btu per hour)	16.738	16.8	15	
Rated steam production capacity (pounds per hour)	13,800	13,800	N/A - Oil heater	
Primary fuel type	Natural Gas	Natural Gas	Natural Gas	
Max. fuel quantity used per hour (include units)	15,761 cu. ft	15,819 cu. ft	14,123 cu. ft	
Max. fuel quantity used per year (include units)	138 MMcu. ft	139 MMcu. ft	124 MMcu. ft	
If oil is used, sulfur content (% by wt.)	N/A	N/A	N/A	
Secondary fuel type	N/A	N/A	N/A	
Max. fuel quantity used per hour (include units)	N/A	N/A	N/A	
Max. fuel quantity used per year (include units)	N/A	N/A	N/A	
If oil is used, sulfur content (% by wt.)	N/A	N/A	N/A	
Stack identification	B4	B5	F2	
Stack height (feet)	32	40	20	
Stack gas flow rate at maximum load (dscf/minute)	2,577	2,586	2,309	
Control device(s) identification from AQ300	N/A	N/A	N/A	
Continuous monitoring systems				

2. Describe how the boiler(s) is operated. (Refer to instructions for guidance)

Boilers are only used during freezing conditions to provide freeze protection.



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POWER SUPPLY GENERATORS

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Provide the requested information for each generator used to power the plant. If any one of several generators might be used at the plant at any given time, describe the generator with the highest power rating. If more than one generator is permanently located at the plant, describe all of them.

	Primary generator	Generator 2	Generator 3
ID No.	Emergency Generator	Firewater Pump	
Manufacturer	Kohler	Clarke	
Year manufactured	2019	2019	
Size (enter units ^a)	200 kW	209 hp	
Type of fuels used	Diesel	Diesel	
Maximum amount of fuel to be used per hour ^b	15.3 gallons	13.5 gallons	
Projected maximum amount of fuel to be used per year ^b	367 gallons	162 gallons	
Projected maximum number of hours to be operated in one year.	24	12	
Maintenance schedule ^c	Monthly	Monthly	
Manufacturer's emission rates attached (yes/no)	No	No	

^a Units for generator size are either kilowatt or horsepower (kW or hp).

^b Units for the amount of fuel are cubic feet, therms, gallons, etc.

^c "Maintenance schedule" refers to regularly scheduled maintenance only, i.e., annual, monthly, weekly, or none.



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name:

Permit Number:

Process Information

1. ID Number	MLOAD-M
2. Descriptive name	Marine Loading at McCall dock
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading and loading of petroleum, non-petroleum and renewable products at marine vessels.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	batch			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year				
11. Process/device capacity:	Short term capacity		Annual usage	
	Amount	Units	Amount	Units
Unloading				
Various products	12,000	bbl/hr		
Loading				
	See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.			
12. Control devices(s) (yes/no)				No
	If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).			
Potential future connection to MVCU when loading products with higher vapor pressures				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name:

Permit Number:

Process Information

1. ID Number	Oil/W 1
2. Descriptive name	Main oil/water separator
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Separation of oil from wastewater prior to discharging treated wastewater to the sanitary sewer. Assumes 0.1% of wastewater is recoverable oil.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	continuous			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year	8760			
11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Wastewater	18,000	gallons/hr	18,500,000	gallons/yr
Products				
Treated wastewater	17982	gallons/hr	18,481,500	gallons/yr
Recovered oil	18	gallons/hr	18,500	gallons/yr
12. Control devices(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name:

Permit Number:

Process Information

1. ID Number	Oil/W 2
2. Descriptive name	Tank Farm oil water separator
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Separation of oil from wastewater in Tank Farm #2. Assumes 0.1% of wastewater is recoverable oil.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	continuous			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year	8760			
11. Process/device capacity:	Short term capacity		Annual usage	
Raw materials	Amount	Units	Amount	Units
Wastewater	9000	gallons/hr	9,250,000	gallons/yr
Products				
Treated wastewater	8991	gallons/hr	9,240,750	gallons/yr
Recovered oil	9	gallons/hr	9,250	gallons/yr
12. Control devices(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK_RC 1A
2. Descriptive name	Railcar Loading Rack #1A
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Loading or unloading of renewable and distillate products to/from railcars.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	batch			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year				
11. Process/device capacity:	Short term capacity		Annual usage	
Unloading	Amount	Units	Amount	Units
Various Products	84,000	gallons/hr		
Loading				
See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control devices(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
Potential future connection to MVCU for loading volatile products				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK_RC 1B
2. Descriptive name	Railcar Loading Rack #1B
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading or loading of renewable and distillate products to/from railcars. Unloading of crude oil from railcars.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	batch			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year				
11. Process/device capacity:	Short term capacity		Annual usage	
Unloading	Amount	Units	Amount	Units
Various Products	84,000	gallons/hr		
Loading				
	See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.			
12. Control device(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
Potential future connection to MVCU for loading volatile products				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name:

Permit Number:

Process Information

1. ID Number	TRACK_RC 2
2. Descriptive name	Railcar Loading Rack #2
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading or loading of renewable and distillate products to/from railcars. Unloading of crude oil from railcars.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	batch			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year				
11. Process/device capacity:	Short term capacity		Annual usage	
	Amount	Units	Amount	Units
Unloading				
Various Products	84,000	gallons/hr		
Loading				
See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control device(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
Potential future connection to MVCU for loading volatile products				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK_RC 3
2. Descriptive name	Railcar Loading Rack #3
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading or loading of renewable and distillate products to/from railcars. Unloading of crude oil from railcars.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	batch			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year				
11. Process/device capacity:	Short term capacity		Annual usage	
	Amount	Units	Amount	Units
Unloading				
Various Products	84,000	gallons/hr		
Loading				
See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control device(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
Potential future connection to MVCU for loading volatile products				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK_RC 4, 5, 6, 7
2. Descriptive name	Manifest Railcar Racks
3. Existing or future?	Future
4. Date commenced	To be determined
5. Date installed/completed	To be determined
6. Description of process:	Unloading of renewable and/or non-fuel products from railcars.

Operating Schedule

7. Seasonal or year-round?	year round			
8. Batch or continuous operation?	batch			
9. Projected maximum hours/day	24			
10. Projected maximum hours/year				
11. Process/device capacity:	Short term capacity		Annual usage	
	Amount	Units	Amount	Units
Unloading				
Various Products	84,000	gallons/hr per rack		
Loading				
No product loading at manifest racks.				
12. Control devices(s) (yes/no)				No
If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK 5
2. Descriptive name	Truck Loading Rack #5
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading and Loading of renewable and distillate products to/from tanker trucks.

Operating Schedule

7. Seasonal or year-round?	year round				
8. Batch or continuous operation?	batch				
9. Projected maximum hours/day	24				
10. Projected maximum hours/year					
11. Process/device capacity:	Short term capacity		Annual usage		
	Unloading	Amount	Units	Amount	Units
	Various Products	36,000	gallons/hr		
	Loading				
	See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control devices(s) (yes/no)					No
	If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
	Potential future connection to MVCU for loading volatile products				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK 6
2. Descriptive name	Truck Loading Rack #6
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading and Loading of renewable and distillate products to/from tanker trucks.

Operating Schedule

7. Seasonal or year-round?	year round				
8. Batch or continuous operation?	batch				
9. Projected maximum hours/day	24				
10. Projected maximum hours/year					
11. Process/device capacity:	Short term capacity		Annual usage		
	Unloading	Amount	Units	Amount	Units
	Various products	36,000	gallons/hr		
	Loading				
	See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control devices(s) (yes/no)					No
	If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
	Potential future connection to MVCU for loading volatile products				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK 7
2. Descriptive name	Truck Loading Rack #7
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading and Loading of renewable and distillate products to/from tanker trucks.

Operating Schedule

7. Seasonal or year-round?	year round				
8. Batch or continuous operation?	batch				
9. Projected maximum hours/day	24				
10. Projected maximum hours/year					
11. Process/device capacity:	Short term capacity		Annual usage		
	Unloading	Amount	Units	Amount	Units
	Various Products	18,000	gallons/hr		
	Loading				
	See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control devices(s) (yes/no)	No				
	If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
	Potential future connection to MVCU for loading volatile products.				



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MISCELLANEOUS PROCESS OR DEVICE

FORM AQ230
ANSWER SHEET

Facility Name: **Zenith Energy Terminal Facility**

Permit Number: **Pending**

Process Information

1. ID Number	TRACK 8
2. Descriptive name	Truck Loading Rack #8
3. Existing or future?	Existing
4. Date commenced	Unknown
5. Date installed/completed	Unknown
6. Description of process:	Unloading and Loading of renewable and distillate products to/from tanker trucks.

Operating Schedule

7. Seasonal or year-round?	year round				
8. Batch or continuous operation?	batch				
9. Projected maximum hours/day	24				
10. Projected maximum hours/year					
11. Process/device capacity:	Short term capacity		Annual usage		
	Unloading	Amount	Units	Amount	Units
	Various products	36,000	gallons/hr		
	Loading				
	See application chapters 2 and 3 and emission calculation workbooks for information on products and loading.				
12. Control devices(s) (yes/no)	No				
	If yes, provide the ID number and complete and attached the applicable series AQ300 form(s).				
	Potential future connection to MVCU for loading volatile products				



**FUME INCINERATOR
CONTROL DEVICE INFORMATION**

**FORM AQ306
ANSWER SHEET**

State of Oregon
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Facility Name: Zenith Energy Terminal Facility

Permit Number: TBD

1.	Control Device ID	MVCU		
2.	Process/Device(s) Controlled	Marine loading (MLOAD)		
3.	Year installed	2017		
4.	Manufacturer/Model No.	Texas Combustion Engineering Custom design		
5.	Control Efficiency (%)	99.8%		
6.	Type of incinerator	Enclosed Flare		
7.	Design temperature (°F)	1400 oF		
8.	Design residence time (sec.)	0.5 seconds		
9.	Design inlet gas flow rate (acfm)	1500 scfm		
10.	Inlet gas pretreatment? (yes/no) If yes, list control device ID and complete a separate control device form	No		
11.	Fuel type	Natural gas assist		
12.	Design maximum hourly amount of fuel (specify units)	18,000 cf natural gas		
13.	Projected maximum annual amount of fuel (specify units)	15,936,000 cf natural gas		

Facility Information	
Facility Name	Zenith Energy Terminal Facility
Facility Address	5501 NW Front Avenue
City	Portland
Zip Code	97210
Source Number (for existing sources)	TBD
Facility Contact	Clay Reese
Phone Number	503-273-4720
Email Address	Clay.Reese@zenithterminals.com

FOR DEQ USE ONLY	
Date Received	
Notes	



**ACDP PERMIT PROGRAM
CATEGORICALLY INSIGNIFICANT ACTIVITIES**

**FORM AQ404
ANSWER SHEET**

Facility name: Zenith Energy Terminal Facility Permit Number: TBD

Indicate which of the following categorically insignificant activities are present at the facility by placing an "X" in the "Yes" or "No" column.

Yes	No	Type of activity	Categorically Insignificant Activities
X			Constituents of a chemical mixture present at less than 1 percent by weight of any chemical or compound regulated under divisions 200 through 268 excluding divisions 248 and 262 of this chapter, or less than 0.1 percent by weight of any carcinogen listed in the U.S. Department of Health and Human Service's Annual Report on Carcinogens when usage of the chemical mixture is less than 100,000 pounds/year
X			Evaporative and tail pipe emissions from on-site motor vehicle operation
X			Distillate oil, kerosene, gasoline, natural gas or propane burning equipment, provided the aggregate expected actual emissions of the equipment identified as categorically insignificant do not exceed the de minimis level for any regulated pollutant, based on the expected maximum annual operation of the equipment. If a source's expected emissions from all such equipment exceed the de minimis levels, then the source may identify a subgroup of such equipment as categorically insignificant with the remainder not categorically insignificant. The following equipment may never be included as categorically insignificant: <ul style="list-style-type: none"> A. Any individual distillate oil, kerosene or gasoline burning equipment with a rating greater than 0.4 million Btu/hour; B. Any individual natural gas or propane burning equipment with a rating greater than 2.0 million Btu/hour
X			Distillate oil, kerosene, gasoline, natural gas or propane burning equipment brought on site for six months or less for maintenance, construction or similar purposes, such as but not limited to generators, pumps, hot water pressure washers and space heaters, provided that any such equipment that performs the same function as the permanent equipment, must be operated within the source's existing PSEL
X			Office activities
X			Food service activities
X			Janitorial activities
X			Personal care activities
X			Grounds keeping activities, including, but not limited to building painting and road and parking lot maintenance
	X		On-site laundry activities
	X		On-site recreation facilities
X			Instrument calibration
X			Maintenance and repair shop
	X		Automotive repair shops or storage garages;
X			Air cooling or ventilating equipment not designed to remove air contaminants generated by or released from associated equipment
X			Refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title VI, including pressure tanks used in refrigeration systems but excluding any combustion equipment associated with such systems
	X		Bench scale laboratory equipment and laboratory equipment used exclusively for chemical and physical analysis, including associated vacuum producing devices but excluding research and development facilities



**ACDP PERMIT PROGRAM
CATEGORICALLY INSIGNIFICANT ACTIVITIES**

**FORM AQ404
ANSWER SHEET**

Yes	No	Type of activity
x		Temporary construction activities
x		Warehouse activities
x		Accidental fires
x		Air vents from air compressors
	x	Air purification systems
	x	Continuous emissions monitoring vent lines
	x	Demineralized water tanks
	x	Pre-treatment of municipal water, including use of deionized water purification systems
	x	Electrical charging stations
	x	Fire brigade training
	x	Instrument air dryers and distribution
	x	Process raw water filtration systems
	x	Pharmaceutical packaging
x		Fire suppression
	x	Blueprint making
x		Routine maintenance, repair, and replacement such as anticipated activities most often associated with and performed during regularly scheduled equipment outages to maintain a plant and its equipment in good operating condition, including but not limited to steam cleaning, abrasive use, and woodworking
x		Electric motors
x		Storage tanks, reservoirs, transfer and lubricating equipment used for ASTM grade distillate or residual fuels, lubricants, and hydraulic fluids
x		On-site storage tanks not subject to any New Source Performance Standard (NSPS), including underground storage tanks (UST), storing gasoline or diesel used exclusively for fueling of the facility's fleet of vehicles
	x	Natural gas, propane, and liquefied petroleum gas (LPG) storage tanks and transfer equipment
	x	Pressurized tanks containing gaseous compounds
	x	Vacuum sheet stacker vents
x		Emissions from wastewater discharges to publicly owned treatment works (POTW) provided the source is authorized to discharge to the POTW, not including on-site wastewater treatment and/or holding facilities
	x	Log ponds
x		Storm water settling basins
x		Fire suppression and training
x		Paved roads and paved parking lots within an urban growth boundary
x		Hazardous air pollutant emissions in fugitive dust from paved and unpaved roads except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soils
x		Health, safety, and emergency response activities



**ACDP PERMIT PROGRAM
CATEGORICALLY INSIGNIFICANT ACTIVITIES**

**FORM AQ404
ANSWER SHEET**

Yes	No	Type of activity
X		Emergency generators and pumps used only during loss of primary equipment or utility service due to circumstances beyond the reasonable control of the owner or operator, or to address a power emergency, provided that the aggregate horsepower rating of all stationary emergency generator and pump engines is not more than 3,000 horsepower. If the aggregate horsepower rating of all stationary emergency generator and pump engines is more than 3,000 horsepower, then no emergency generators and pumps at the source may be considered categorically insignificant
X		Non-contact steam vents and leaks and safety and relief valves for boiler steam distribution systems
X		Non-contact steam condensate flash tanks
	X	Non-contact steam vents on condensate receivers, deaerators and similar equipment
X		Boiler blow down tanks
X		Industrial cooling towers that do not use chromium-based water treatment chemicals
	X	Ash piles maintained in a wetted condition and associated handling systems and activities
	X	Uncontrolled oil/water separators in effluent treatment systems, excluding systems with a throughput of more than 400,000 gallons per year of effluent located at the following sources: A. Petroleum refineries; B. Sources that perform petroleum refining and re-refining of lubricating oils and greases including asphalt production by distillation and the reprocessing of oils and/or solvents for fuels; or C. Bulk gasoline plants, bulk gasoline terminals, and pipeline facilities
X		Combustion source flame safety purging on startup
	X	Broke beaters, pulp and repulping tanks, stock chests and pulp handling equipment, excluding thickening equipment and repulpers
	X	Stock cleaning and pressurized pulp washing, excluding open stock washing systems
	X	White water storage tanks

Appendix B- LUCS



Land Use Compatibility Statement

What is a Land Use Compatibility Statement?

A LUCS is a form developed by DEQ to determine whether a DEQ permit or approval will be consistent with local government comprehensive plans and land use regulations.

Why is a LUCS required?

DEQ and other state agencies with permitting or approval activities that affect land use are required by Oregon law to be consistent with local comprehensive plans and have a process for determining consistency. DEQ activities affecting land use and the requirement for a LUCS may be found in Oregon Administrative Rules (OAR) Chapter 340, Division 18.

When is a LUCS required?

A LUCS is required for nearly all DEQ permits and certain approvals of plans or related activities that affect land use prior to issuance of a DEQ permit or approval. These permits and activities are listed in section 1.D on p. 2 of this form. A single LUCS can be used if more than one DEQ permit or approval is being applied for concurrently.

Permit modifications or renewals also require a LUCS when any of the following applies:

1. Physical expansion on the property or proposed use of additional land;
2. Alterations, expansions, improvements or changes in method or type of disposal at a solid waste disposal site as described in OAR 340-093-0070(4)(b);
3. A significant increase in discharges to water;
4. A relocation of an outfall outside of the source property; or
5. Any physical change or change of operation of an air pollutant source that results in a net significant emission rate increase as defined in OAR 340-200-0020.

How to complete a LUCS:

Step	Who does it?	What happens?
1.	Applicant	Applicant completes Section 1 of the LUCS and submits it to the appropriate city or county planning office.
2.	City or County Planning Office	City or county planning office completes Section 2 of the LUCS to indicate whether the activity or use is compatible with the acknowledged comprehensive plan and land use regulations, attaches written findings supporting the decision of compatibility, and returns the signed and dated LUCS to the applicant.
3.	Applicant	Applicant submits the completed LUCS and any supporting information provided by the city or county to DEQ along with the DEQ permit application or approval request.

Where to get help:

For questions about the LUCS process, contact the DEQ staff responsible for processing the permit or approval. DEQ staff may be reached at 1-800-452-4011 (toll-free, inside Oregon) or 503-229-5630. For general questions, please contact DEQ land use staff listed on our [Land Use Compatibility Statement page](#) online.

Cultural resources protection laws:

Applicants involved in ground-disturbing activities should be aware of federal and state cultural resources protection laws. ORS 358.920 prohibits the excavation, injury, destruction, or alteration of an archeological site or object or removal of archeological objects from public and private lands without an archeological permit issued by the State Historic Preservation Office. 16 USC 470, Section 106, National Historic Preservation Act of 1966 requires a federal agency, prior to any undertaking, to take into account the effect of the undertaking that is included on or eligible for inclusion in the National Register. For further information, contact the State Historic Preservation Office at 503-378-4168, ext. 232.

Section 1 – To be completed by the applicant

1A. Applicant Name: Zenith Energy Terminals Holdings LLC	1B. Project Name: Near-Term Phase Out of All Crude Oil
Contact Name: Dana Krawczuk, Stoel Rives LLP	Physical Address: 5501 NW Front Avenue
Mailing Address: 760 SW 9th Avenue, 30th Floor	City, State, Zip: Portland, OR 97210
City, State, Zip: Portland, OR 97205	Tax Lot #: 400, 500, 1500
Telephone: (503) 294-9218	Township: 1N Range: 1E Section: 18, 19
Tax Account #: R941190640; R941191220; R941180140	Latitude: 45°33'38.42" N
	Longitude: 122°44'07.23" W

1C. Describe the project, include the type of development, business, or facility and services or products provided (attach additional information if necessary):

Please see attached description.

- 1D. Check the type of DEQ permit(s) or approval(s) being applied for at this time.
- | | |
|---|--|
| <input checked="" type="checkbox"/> Air Quality Notice of Construction | <input type="checkbox"/> Clean Water State Revolving Fund Loan Request |
| <input checked="" type="checkbox"/> Air Contaminant Discharge Permit | <input type="checkbox"/> Wastewater/Sewer Construction Plan/ Specifications (includes review of plan changes that require use of new land) |
| <input checked="" type="checkbox"/> Air Quality Title V Permit | <input type="checkbox"/> Water Quality NPDES Individual Permit |
| <input type="checkbox"/> Air Quality Indirect Source Permit | <input type="checkbox"/> Water Quality WPCF Individual Permit (for onsite construction-installation permits use the DEQ Onsite LUCS form) |
| <input type="checkbox"/> Parking/Traffic Circulation Plan | <input type="checkbox"/> Water Quality NPDES Stormwater General Permit (1200-A, 1200-C, 1200-CA, 1200-COLS, and 1200-Z) |
| <input type="checkbox"/> Solid Waste Land Disposal Site Permit | <input type="checkbox"/> Water Quality General Permit (all general permits, except 600, 700-PM, 1700-A, and 1700-B when they are mobile) |
| <input type="checkbox"/> Solid Waste Treatment Facility Permit | <input type="checkbox"/> Water Quality 401 Certification for federal permit or license |
| <input type="checkbox"/> Solid Waste Composting Facility Permit (includes Anaerobic Digester) | |
| <input type="checkbox"/> Conversion Technology Facility Permit | |
| <input type="checkbox"/> Solid Waste Letter Authorization Permit | |
| <input type="checkbox"/> Solid Waste Material Recovery Facility Permit | |
| <input type="checkbox"/> Solid Waste Energy Recovery Facility Permit | |
| <input type="checkbox"/> Solid Waste Transfer Station Permit | |
| <input type="checkbox"/> Waste Tire Storage Site Permit | |
| <input type="checkbox"/> Pollution Control Bond Request | |
| <input type="checkbox"/> Hazardous Waste Treatment, Storage or Disposal Permit | |

This application is for: Permit Renewal New Permit Permit Modification Other:

Section 2 – To be completed by city or county planning official

Applicant name: **Zenith Energy Terminals Holdings LLC** | Project name: **Near-Term Phase Out of All Crude Oil**

Instructions: Written findings of fact for all local decisions are required; written findings from previous actions are acceptable. For uses allowed outright by the acknowledged comprehensive plan, DEQ will accept written findings in the form of a reference to the specific plan policies, criteria, or standards that were relied upon in rendering the decision with an indication of why the decision is justified based on the plan policies, criteria, or standards.

2A. The project proposal is located: Inside city limits Inside UGB Outside UGB

2B. Name of the city or county that has land use jurisdiction (the legal entity responsible for land use decisions for the subject property or land use): **City of Portland**

2C. This project is not within the jurisdiction of any other land use, zoning, or planning entity
 This project is also within the jurisdiction of the following land use, zoning, or planning entity _____

2D. Is the activity allowed under Measure 49 (2007)? No, Measure 49 is not applicable Yes, if yes, then check one:

Express; approved by DLCD order #:

Conditional; approved by DLCD order #:

Vested; approved by local government decision or court judgment docket or order #:

2E. Is the activity a composting facility?
 No Yes; Senate Bill 462 (2013) notification requirements have been met.

2F. Is the activity or use compatible with your acknowledged comprehensive plan as required by OAR 660-031? Please complete this form to address the activity or use for which the applicant is seeking approval (see 1.C on the previous page). If the activity or use is to occur in multiple phases, please ensure that your approval addresses the phases described in 1C. For example, if the applicant's project is described in 1C. as a subdivision and the LUCS indicates that only clearing and grading are allowed outright but does not indicate whether the subdivision is approved, DEQ will delay permit issuance until approval for the subdivision is obtained from the local planning official.

The activity or use is specifically exempt by the acknowledged comprehensive plan; explain:

Yes, the activity or use is pre-existing nonconforming use allowed outright by (provide reference for local ordinance):

Yes, the activity or use is allowed outright by (provide reference for local ordinance):

Yes, the activity or use received preliminary approval that includes requirements to fully comply with local requirements; findings are attached.


Yes, the activity or use is allowed; findings are attached.

No, see 2D. above, activity or use allowed under Measure 49; findings are attached.

No, (complete below or attach findings for noncompliance and identify requirements the applicant must comply with before compatibility can be determined):
Relevant specific plan policies, criteria, or standards:

Provide the reasons for the decision:

Additional comments (attach additional information as needed):

Planning Official Signature:  Title: **City Planner**

Print Name: **Andrew Gulizia** Telephone #: **503-865-6714** Date: **10/3/2022**

If necessary, depending upon city/county agreement on jurisdiction outside city limits but within UGB:

Planning Official Signature: Title:

Print Name: Telephone #: Date:

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

1C. Describe the project, include the type of development, business, or facility and services or products provided (attach additional information if necessary):

Summary: Applicant seeks this LUCS for purposes of obtaining an Air Contaminant Discharge Permit (“ACDP”) that will facilitate the existing use’s continued transition toward renewable fuels by (1) phasing out all crude oil at the site within five years and (2) reducing – through disassembly and removal – 30 of the existing storage tanks on the site within seven years (the “**Repositioned Facility**”). These near-term changes will eliminate crude oil activity (whether by rail, marine, or otherwise) on site and continue to move the facility toward renewable fuels while also further improving resiliency. This LUCS will also serve to support Air Quality Notice of Construction (aka Notice of Approval) applications as needed to effectuate the activities stated below.

Details: No new development or facilities for handling fossil fuels are proposed. No new storage tanks or rail racks (whether for fossil fuels, renewable fuels, or non-fuel products) are proposed in connection with this LUCS application. This LUCS is limited to (1) new or modified piping, headers, pumps, valves, etc. that require an Air Quality Notice of Construction and are needed to transload renewable fuels (*e.g.*, installing a header for renewable fuels on the existing rail racks to load and unload renewable fuels and refurbishing an existing truck rack to deliver additional renewable fuels within the region) or otherwise effectuate the activities described in this application, (2) application for a new ACDP for operations consistent with this application, and (3) Title V Air Operating Permit No. 26-2025 until such time as that Title V permit is terminated consistent with this LUCS application.

The site is located at 5501 NW Front Avenue, which is within the Heavy Industrial (IH) zone, and currently contains an existing petroleum, petroleum products, and renewable fuels bulk distribution terminal and asphalt refinery (SIC Codes 4226 and 2911), including bulk storage tanks with an aggregate capacity of 1,518,200 barrels, 44 railcar spots, rail and truck racks, vapor combustion unit (which destroys emissions associated with marine loading of volatile fuels stored at the terminal), piping, fire suppression equipment and facilities, and other associated structures, facilities and equipment.

The Repositioned Facility will be limited by the following after affirmative approval of this LUCS application (the “**Approval**”) and for so long as the ACDP application to which this LUCS pertains is pending and the resulting ACDP permit remains in full force and effect (with such limitations being conditions enforceable by the City of Portland pursuant to PCC 33.700.030⁹):

1. **Near-Term Phase Out of All Crude Oil.** Of the existing 44 railcar spots on the site, (a) the eight railcar spots that comprise Railcar Rack #1A (*i.e.*, railcar spots 501-504 & 701-704), which are identified on the site plan attached as Exhibit A, will not be used to transload crude oil during the five-year period immediately following the Approval, and (b) the other 36 railcar spots and the site in its entirety will not be used to transload crude oil from and after the fifth anniversary of the Approval. For the avoidance of doubt, the

⁹ To the extent the Oregon Dep’t of Environmental Quality incorporates these limitations into the ACDP, they will also be enforceable by the Oregon Dep’t of Environmental Quality under the ACDP. Regardless, though, these limitations will be enforceable with respect to the site – including, but not limited to, the current property owner/operator – by the City of Portland under the LUCS.

site will not store or handle crude oil (whether by rail, marine, or otherwise) after the fifth anniversary of the Approval.

2. **Near-Term Reduction of Existing Storage Tank Capacity.** The thirty (30) storage tanks identified in blue on the site plan attached as Exhibit A-1 will be disassembled and removed from the site over seven years from the Approval. Zenith will not build new storage tanks to replace the removed capacity, provided that this limitation shall not limit replacement and/or reconfiguration of the resulting decreased aggregate storage tank capacity or preclude the construction of new storage tank capacity, so long as such new storage tank capacity is used solely for renewable fuels and non-fuel products.
3. **Reduce Allowable Emissions of Volatile Organic Compounds by Nearly 80%.** This LUCS will enable an application for an ACDP to replace Title V Air Operating Permit No. 26-2025. The requested ACDP will require volatile organic compound (VOC) emissions be less than 40 tpy. In contrast, Title V Air Operating Permit No. 26-2025 allows 179 tpy, which is over 4.5 times as much VOCs on an annual basis.
4. **Asphalt Refinery Not to be Operated After Issuance of the ACDP.** The owner/operator of the terminal will request, no later than 30 days after issuance of an ACDP consistent with this LUCS application and successful resolution of any and all appeals or petitions for reconsideration such that the ACDP is in full force and effect, that DEQ immediately terminate Title V Air Operating Permit No. 26-2025. The ACDP will not authorize asphalt refining, the feedstock for which is crude oil.

As used above, fossil fuels are synonymous with the definition of “fossil fuel” in PCC 33.910.030 that was recently adopted in Ordinance 190978.

Compliance Measures: The applicant, which is the property owner/operator of the Repositioned Facility that is the subject of this LUCS, agrees to the following measures to assure compliance with the limited use subject to this LUCS:

- A. To ensure the site is not used in a manner that conflicts with the crude oil phase out limitation detailed in #1 above, the property owner/operator of the terminal will:
 - i. Immediately upon issuance of the Approval, not use the eight railcar spots that comprise Railcar Rack #1A (*i.e.*, railcar spots 501-504 & 701-704), which are identified on the site plan attached as Exhibit A, for unloading crude oil. The property owner/operator will allow City inspectors, immediately upon request, to access the terminal to confirm that those railcar spots are not used to unload crude oil. In addition, within 180 days after issuance of the Approval, the property owner/operator will disconnect the existing crude oil header at those eight railcar spots so that they cannot be used to unload crude oil. A section of pipe will be physically cut out and removed so those eight railcar spots will no longer have connectivity to the crude oil header.¹⁰ The property owner/operator will allow City

¹⁰ As customers schedule deliveries to the terminal months in advance, time is needed to coordinate schedules to create a sufficient window in the delivery schedule for this disconnection work to be completed.

inspectors, immediately upon request, to access the terminal to confirm that such header has been so disconnected no later than 180 days following the Approval.

- ii. Hire, at its sole expense, an independent, third-party to inspect, sample and test materials delivered to the terminal and unloaded at the aforementioned eight railcar spots during the five-year period immediately following the Approval or thereafter any railcar spot on the site. The independent, third party must be an EPA registered laboratory and acceptable to the City. In each calendar quarter the independent third-party will conduct at least one random inspection and take samples of and test such delivered materials. The third-party testing service shall conduct such sampling, testing or inspections as the third-party testing service determines is necessary, in its professional judgment, to determine whether the sampled materials are crude oil. Within 30 days of sampling, inspection, and testing, the independent, third-party will report to BDS Land Use Services whether the sampled materials are crude oil. Samples shall be taken from the piping (*e.g.*, from an in-line sampling port) running between the applicable rail racks and the existing storage tanks within which such materials are stored. The report to BDS Land Use Services must be accompanied by a signed statement from the independent third-party's qualified professional certifying that the materials sampled are not crude oil. In addition, the City has the right to review and verify the third-party's sampling data but is not authorized to take possession of the data, and the property owner/operator will allow City inspectors, immediately upon request, to access the terminal and infrastructure to conduct its own sampling and testing.
- B. To ensure that storage tank capacity on the site is reduced consistent with #2 above, within 30 days after the end of every calendar quarter following the Approval, the property owner/operator of the terminal will report to BDS Land Use Services on the storage tanks so disassembled and removed in the prior calendar quarter. Timeline:
- i. By the second anniversary of the Approval, no less than seven storage tanks shall have been disassembled and removed;
 - ii. By the fourth anniversary of the Approval, no less than 14 storage tanks shall have been disassembled and removed;
 - iii. By the sixth anniversary of the Approval, no less than 21 storage tanks shall have been disassembled and removed; and
 - iv. By the seventh anniversary of the Approval, 30 storage tanks shall have been disassembled and removed.

If storage tank disassembly and removal pursuant to the above timeline is delayed by force majeure, this timeline shall be adjusted accordingly.

- C. To ensure that allowable emissions of VOC are decreased consistent with #3 above, the property owner/operator of the terminal will apply for an ACDP with a less than 40 tpy VOC plant site emission limit to replace the current Title V Air Operating Permit No. 26-2025 and, concurrent with submitting its application for an ACDP to DEQ, transmit a copy

of such application to BDS Land Use Services. No later than 30 days after issuance of an ACDP consistent with this LUCS application and successful resolution of any and all appeals or petitions for reconsideration such that the ACDP is in full force and effect, the owner/operator of the terminal will request that DEQ immediately terminate Title V Air Operating Permit No. 26-2025 and concurrently transmit a copy of such request to BDS Land Use Services.

- D. To ensure that the asphalt refinery is not operated consistent with #4 above, the property owner/operator of the terminal will, no later than 30 days after issuance of an ACDP consistent with this LUCS application and successful resolution of any and all appeals or petitions for reconsideration such that the ACDP is in full force and effect, request that DEQ immediately terminate Title V Air Operating Permit No. 26-2025 and concurrently transmit a copy of such request to BDS Land Use Services.

Appendix C- Safety Data Sheets

Safety Data Sheet



SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

AVIATION GASOLINE

Product Use: Fuel
Product Number(s): 200205, 200239, 200285, 200456
Synonyms: Avgas 100, Avgas 100 LL
Company Identification
Chevron Products Company
6001 Bollinger Canyon Rd., T3325/B10
San Ramon, CA 94583
United States of America

Transportation Emergency Response

CHEMTREC: (800) 424-9300 or (703) 527-3887

Health Emergency

Chevron Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623

Product Information

Product Information: (800) 582-3835
SDS Requests: (800) 414-6737

SECTION 2 HAZARDS IDENTIFICATION

CLASSIFICATION: Flammable liquid: Category 2. Aspiration toxicant: Category 1. Reproductive toxicant (developmental): Category 1A. Target organ toxicant (repeated exposure): Category 1. Carcinogen: Category 1B. Germ Cell Mutagen: Category 1B. Skin irritation: Category 2. Target organ toxicant (central nervous system): Category 3. Acute aquatic toxicant: Category 2. Chronic aquatic toxicant: Category 2.



Signal Word: Danger

Physical Hazards: Highly flammable liquid and vapor.

Health Hazards: May be fatal if swallowed and enters airways. May cause genetic defects. May cause cancer. Causes skin irritation. May cause drowsiness or dizziness. May damage the unborn child.

Target Organs: Causes damage to organs (Blood/Blood Forming Organs, Kidney, Liver, Nervous System) through prolonged or repeated exposure.

Environmental Hazards: Toxic to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS:

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat/sparks/open flames/hot surfaces. -- No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use explosion-proof electrical/ventilating/lighting/equipment. Do not breathe dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment.

Response: IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. IF ON SKIN (or hair): Take off immediately all contaminated clothing and wash it before reuse. Rinse skin with water/shower. IF SWALLOWED: Immediately call a poison center or doctor/physician. Do NOT induce vomiting. Call a poison center or doctor/physician if you feel unwell. Get medical advice/attention if you feel unwell. IF exposed or concerned: Get medical advice/attention. In case of fire: Use media specified in the SDS to extinguish. Specific treatment (see Notes to Physician on this label). Collect spillage.

Storage: Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Disposal: Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

HAZARDS NOT OTHERWISE CLASSIFIED: Not Applicable

SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Naphtha, light alkylate	64741-66-8	70 - 100 %volume
Toluene	108-88-3	0 - 20 %volume
Naphtha, isomerization	64741-70-4	0 - 10 %volume
Benzene	71-43-2	0 - 1 %volume
Tetraethyl lead	78-00-2	0 - 0.1 %volume

Ethylene dibromide	106-93-4	0 - 0.1 %volume
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SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.

Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.

Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.

Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue or if any other symptoms develop.

Most important symptoms and effects, both acute and delayed

IMMEDIATE HEALTH EFFECTS

Eye: Not expected to cause prolonged or significant eye irritation.

Skin: Contact with the skin causes irritation. Skin contact may cause drying or defatting of the skin.

Contact with the skin is not expected to cause an allergic skin response. Symptoms may include pain, itching, discoloration, swelling, and blistering.

Ingestion: Highly toxic; may be fatal if swallowed. Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.

Inhalation: Excessive or prolonged breathing of this material may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:

Reproduction and Birth Defects: Contains material that may cause harm to the unborn child if inhaled above the recommended exposure limit based on animal data.

Cancer: Prolonged or repeated exposure to this material may cause cancer. Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Genetic Toxicity: May cause heritable genetic damage based on animal data.

Target Organs: Contains material that may cause damage to the following organ(s) following repeated exposure: Liver Kidney Nervous System Blood/Blood Forming Organs Risk depends on duration and

level of exposure. See Section 11 for additional information.

Indication of any immediate medical attention and special treatment needed

Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Unusual Fire Hazards: See Section 7 for proper handling and storage.

PROTECTION OF FIRE FIGHTERS:

Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.

Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

Precautionary Measures: This product presents an extreme fire hazard. Liquid very quickly evaporates, even at low temperatures, and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Do not breathe vapor or fumes. Wash thoroughly after handling.

Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this

material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating and accumulating an electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures.

Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

General Storage Information: DO NOT USE OR STORE near heat, sparks, flames, or hot surfaces . USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION
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GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.

Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted.

Suggested materials for protective gloves include: Chlorinated Polyethylene (or Chlorosulfonated Polyethylene), Nitrile Rubber, Polyurethane, Viton.

Respiratory Protection: Determine if airborne concentrations are below the recommended occupational exposure limits for jurisdiction of use. If airborne concentrations are above the acceptable limits, wear an approved respirator that provides adequate protection from this material, such as: Air-Purifying Respirator for Organic Vapors.

Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:



Component	Agency	TWA	STEL	Ceiling	Notation
Naphtha, light alkylate	Not Applicable	--	--	--	--
Toluene	ACGIH	20 ppm (weight)	--	--	--
Toluene	OSHA Z-2	200 ppm (weight)	--	300 ppm (weight)	--
Naphtha, isomerization	Not Applicable	--	--	--	--
Benzene	ACGIH	.5 ppm (weight)	2.5 ppm (weight)	--	Skin A1 Skin
Benzene	OSHA SRS	1 ppm (weight)	5 ppm (weight)	--	--
Benzene	OSHA Z-2	10 ppm (weight)	--	25 ppm (weight)	--
Benzene	CVX	1 ppm (weight)	5 ppm (weight)	--	--
Tetraethyl lead	OSHA SRS	.05 mg/m3	--	--	--
Tetraethyl lead	OSHA Z-1	.075 mg/m3	--	--	Skin as Pb
Tetraethyl lead	ACGIH	.1 mg/m3	--	--	Skin as Pb
Ethylene dibromide	OSHA Z-2	20 ppm (weight)	--	30 ppm (weight)	--

Consult local authorities for appropriate values.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Blue or green dyed

Physical State: Liquid

Odor: Petroleum odor

Odor Threshold: No data available

pH: Not Applicable

Vapor Pressure: 38 - 49 kPa @ 38 °C (100.4 °F)

Vapor Density (Air = 1): 3 - 4 (Estimated)

Initial Boiling Point: 60°C (140°F) - 170°C (338°F)

Solubility: Low PPM range in water.

Freezing Point: -58°C (-72.4°F) (Max)

Specific Gravity: 0.65 - 0.75 @ 15°C (59°F)

Viscosity: <1 SUS @ 37.8°C (100°F)

Decomposition temperature: No data available

Octanol/Water Partition Coefficient: No data available

FLAMMABLE PROPERTIES:

Flammability (solid, gas): No Data Available

Flashpoint: (Tagliabue Closed Cup ASTM D56) -46 °C (-51 °F) (Min)

Autoignition: 440 °C (824 °F)

Flammability (Explosive) Limits (% by volume in air): Lower: 1.2 Upper: 7

SECTION 10 STABILITY AND REACTIVITY

Reactivity: May react with strong acids or strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Incompatibility With Other Materials: Not applicable

Hazardous Decomposition Products: None known (None expected)

Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Serious Eye Damage/Irritation: The eye irritation hazard is based on evaluation of data for similar materials.

Skin Corrosion/Irritation: The skin irritation hazard is based on evaluation of data for similar materials.

Skin Sensitization: The skin sensitization hazard is based on evaluation of data for similar materials or product components.

Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials.

Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for product components.

Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for product components.

Acute Toxicity Estimate: Not Determined

Germ Cell Mutagenicity: The hazard evaluation is based on data for components or a similar material.

Carcinogenicity: The hazard evaluation is based on data for components or a similar material. Contains benzene, which has been classified as a carcinogen by the National Toxicology Program (NTP) and a Group 1 carcinogen (carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

Reproductive Toxicity: The hazard evaluation is based on data for components or a similar material.



Specific Target Organ Toxicity - Single Exposure: The hazard evaluation is based on data for components or a similar material.

Specific Target Organ Toxicity - Repeated Exposure: The hazard evaluation is based on data for components or a similar material.

ADDITIONAL TOXICOLOGY INFORMATION:

This product contains Light Alkylation Naphtha (CAS64741-66-8). A light-end fraction of this material was used to evaluate its reproductive and developmental effects on rats in a modified OECD Guideline No. 412 study. The highest inhalation exposure was 60% of the lower explosive limit for the light-end fraction. Exposure had no effect on food consumption, body weights, absolute and relative organ weights, histopathology, or reproductive indices. All groups had comparable delivery data and a fertility index of greater than 80 %. Pups in all groups showed comparable birth weights, weight gain, and viability index (postnatal day 4). The NOAEL was greater than 24.7 g/m³. The inhalation subchronic and neurotoxic potential of the light-end fraction was evaluated in a 13-week study following TSCA Health Effects Test Guidelines and EPA Neurotoxicity Testing Guidelines (1989). The highest exposure was 75% of the lower explosive limit for the light-end fraction. No test related mortality or effects on physical signs, body weight or food consumption were observed. Statistically significant increases in absolute and relative kidney weights in high dose males correlated with microscopically observed hyaline droplet formation. Increase liver weights in both sexes at the highest dose had no microscopic correlate and appeared reversible after the 4 week recovery period. Exposure at any dose did not produce neurotoxicity as measured by motor activity, functional observational battery, or neuropathology. The NOEL was 2220 ppm for subchronic toxicity and greater than 6646 ppm for neurotoxicity.

This product contains an inorganic lead compound. Inorganic lead may be harmful if swallowed or inhaled. Chronic overexposure to lead can also cause damage to kidneys, and reproductive, blood-forming, and nervous systems. Inorganic lead has been shown to cross the placenta, and exposure has been reported to cause adverse reproductive effects in humans and animals. The carcinogenic potential of lead salts (primarily phosphates and acetates) administered via the oral route or by injection has been demonstrated in rats and mice.

This product contains toluene.

GENERAL TOXICITY: The primary effects of exposure to toluene in animals and humans are on the central nervous system. Solvent abusers, who typically inhale high concentrations (thousands of ppm) for brief periods of time, in addition to experiencing respiratory tract irritation, often suffer permanent central nervous system effects that include tremors, staggered gait, impaired speech, hearing and vision loss, and changes in brain tissue. Death in some solvent abusers has been attributed to cardiac arrhythmias, which appear to have been triggered by epinephrine acting on solvent sensitized cardiac tissue. Although liver and kidney effects have been seen in some solvent abusers, results of animal testing with toluene do not support these as primary target organs.

HEARING: Humans who were occupationally exposed to concentrations of toluene as low as 100 ppm for long periods of time have experienced hearing deficits. Hearing loss, as demonstrated using behavioral and electrophysiological testing as well as by observation of structural damage to cochlear hair cells, occurred in experimental animals exposed to toluene. It also appears that toluene exposure and noise may interact to produce hearing deficits.

COLOR VISION: In a single study of workers exposed to toluene at levels under 50 ppm, small decreases in the ability to discriminate colors in the blue-yellow range have been reported for female workers. This effect, which should be investigated further, is very subtle and would not likely have been noticed by the people tested.

REPRODUCTIVE/DEVELOPMENTAL TOXICITY: Toluene may also cause mental and/or growth retardation in the children of female solvent abusers who directly inhale toluene (usually at thousands of ppm) when they are pregnant. Toluene caused growth retardation in rats and rabbits when administered at doses that were toxic to the mothers. In rats, concentrations of up to 5000 ppm did not cause birth defects. No effects were observed in the offspring at doses that did not intoxicate the pregnant animals. The exposure level at which no effects were seen (No Observed Effect Level, NOEL) is 750 ppm in the rat and 500 ppm in the rabbit.

This product contains benzene.

GENETIC TOXICITY/CANCER: Repeated or prolonged breathing of benzene vapor has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal. In some individuals, benzene exposure can sensitize cardiac tissue to epinephrine which may precipitate fatal ventricular fibrillation.

REPRODUCTIVE/DEVELOPMENTAL TOXICITY: No birth defects have been shown to occur in pregnant laboratory animals exposed to doses not toxic to the mother. However, some evidence of fetal toxicity such as delayed physical development has been seen at such levels. The available information on the effects of benzene on human pregnancies is inadequate but it has been established that benzene can cross the human placenta.

OCCUPATIONAL: The OSHA Benzene Standard (29 CFR 1910.1028) contains detailed requirements for training, exposure monitoring, respiratory protection and medical surveillance triggered by the exposure level. Refer to the OSHA Standard before using this product.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY

This material is expected to be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.

96 hour(s) LC50: 8.3 mg/l (Cyprinodon variegatus)

MOBILITY

No data available.

PERSISTENCE AND DEGRADABILITY

This material is not expected to be readily biodegradable. Following spillage, the more volatile components of gasoline will be rapidly lost, with concurrent dissolution of these and other constituents into the water. Factors such as local environmental conditions (temperature, wind, mixing or wave action, soil type, etc), photo-oxidation, biodegradation and adsorption onto suspended sediments, can contribute to the

weathering of spilled gasoline.

POTENTIAL TO BIOACCUMULATE

Bioconcentration Factor: No data available.

Octanol/Water Partition Coefficient: No data available

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by international, country, or local laws and regulations.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Description: UN1203, GASOLINE, 3, II, MARINE POLLUTANT (GASOLINE LEADED) RQ (TETRAETHYL LEAD WITH 10 LBS OR GREATER AND/OR ETHYLENE DIBROMIDE WITH 1 LB OR GREATER WHEN CONTAINED IN A SINGLE BULK PACKAGING)

IMO/IMDG Shipping Description: UN1203, GASOLINE, 3, II, FLASH POINT SEE SECTION 5 OR 9, MARINE POLLUTANT (GASOLINE LEADED)

ICAO/IATA Shipping Description: UN1203, GASOLINE, 3, II

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:
Not applicable

SECTION 15 REGULATORY INFORMATION

EPCRA 311/312 CATEGORIES:	1. Immediate (Acute) Health Effects:	YES
	2. Delayed (Chronic) Health Effects:	YES
	3. Fire Hazard:	YES
	4. Sudden Release of Pressure Hazard:	NO
	5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01-1=IARC Group 1 03=EPCRA 313

01-2A=IARC Group 2A
01-2B=IARC Group 2B
02=NTP Carcinogen

04=CA Proposition 65
05=MA RTK
06=NJ RTK
07=PA RTK

The following components of this material are found on the regulatory lists indicated.

Tetraethyl lead	03, 04, 05, 06, 07
Ethylene dibromide	01-2A, 02, 03, 04, 05, 06, 07
Benzene	01-1, 02, 03, 04, 05, 06, 07
Toluene	03, 04, 05, 06, 07

CERCLA REPORTABLE QUANTITIES(RQ)/EPCRA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Benzene	10 lbs	None	739 lbs
Ethylene dibromide	1 lbs	None	616 lbs
Tetraethyl lead	10 lbs	None	6155 lbs
Toluene	1000 lbs	None	3736 lbs

CHEMICAL INVENTORIES:

All components comply with the following chemical inventory requirements: AICS (Australia), DSL (Canada), EINECS (European Union), ENCS (Japan), IECSC (China), KECI (Korea), PICCS (Philippines), TSCA (United States).

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 1 Flammability: 3 Reactivity: 0

HMIS RATINGS: Health: 2* Flammability: 3 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This revision updates the following sections of this Safety Data Sheet: 1,16
Revision Date: DECEMBER 07, 2015

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV - Threshold Limit Value	TWA - Time Weighted Average
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STEL - Short-term Exposure Limit	PEL - Permissible Exposure Limit
GHS - Globally Harmonized System	CAS - Chemical Abstract Service Number
ACGIH - American Conference of Governmental Industrial Hygienists	IMO/IMDG - International Maritime Dangerous Goods Code
API - American Petroleum Institute	SDS - Safety Data Sheet
HMIS - Hazardous Materials Information System	NFPA - National Fire Protection Association (USA)
DOT - Department of Transportation (USA)	NTP - National Toxicology Program (USA)
IARC - International Agency for Research on Cancer	OSHA - Occupational Safety and Health Administration
NCEL - New Chemical Exposure Limit	EPA - Environmental Protection Agency
SCBA - Self-Contained Breathing Apparatus	

Prepared according to the 29 CFR 1910.1200 (2012) by Chevron Energy Technology Company, 6001 Bollinger Canyon Road San Ramon, CA 94583.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

SAFETY DATA SHEET



Revision Date 07-Mar-2018

SDS Number 888100008868

Revision Number 1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

Product Name

Bakken Crude Oil

Synonyms

None

Recommended Use
Uses advised against

Feedstock
All others

Manufacturer

Tesoro Refining & Marketing Co.
19100 Ridgewood Parkway
San Antonio, TX 78259

Emergency

Telephone

Chemtrec: 1-800-424-9300

Tesoro Call Center: 1-877-783-7676

E-mail address

ProductStewardship@TSOCORP.com

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids	Category 2
Acute dermal toxicity	Category 4
Acute Inhalation Toxicity - Dusts and Mists	Category 4
Skin Corrosion/Irritation Category	Category 2
Serious eye damage/eye irritation	Category 2A
Germ cell mutagenicity	Category 1B
Carcinogenicity	Category 1A
Reproductive toxicity	Category 2
Specific target organ toxicity (single exposure)	Category 3
Specific target organ toxicity (repeated exposure)	Category 1
Acute Aquatic Toxicity	Category 1
Chronic Aquatic Toxicity	Category 1
Aspiration toxicity	Category 1

Label elements

Danger

Highly flammable liquid and vapor
Harmful in contact with skin
Harmful if inhaled
Causes skin irritation
Causes serious eye irritation

May cause genetic defects
May cause cancer
Suspected of damaging fertility or the unborn child
May cause respiratory irritation. May cause drowsiness or dizziness
Causes damage to organs through prolonged or repeated exposure
Very toxic to aquatic life with long lasting effects
May be fatal if swallowed and enters airways



Appearance Liquid

Physical State @20°C Liquid

Odor Petroleum asphalt

Precautionary Statements - Prevention

Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Wear protective gloves/protective clothing/eye protection/face protection
Use only outdoors or in a well-ventilated area
Wash face, hands and any exposed skin thoroughly after handling
Do not breathe dust/fume/gas/mist/vapors/spray
Do not eat, drink or smoke when using this product
Keep away from heat/sparks/open flames/hot surfaces. - No smoking
Keep container tightly closed
Ground/or bond container and receiving equipment
Use explosion-proof electrical/ ventilating / lighting / equipment
Use only non-sparking tools
Take precautionary measures against static discharge
Keep cool

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Call a POISON CENTER or doctor if you feel unwell
If skin irritation occurs: Get medical advice/attention
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower
Wash contaminated clothing before reuse
IF INHALED: Remove person to fresh air and keep comfortable for breathing
IF SWALLOWED: Immediately call a POISON CENTER or doctor
Do NOT induce vomiting
In case of fire: Use CO₂, dry chemical, or foam to extinguish

Precautionary Statements - Storage

Store locked up
Store in a well-ventilated place. Keep container tightly closed

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Other Information

May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS-No	Percent
Petroleum; Crude oil	8002-05-9	0-100
Xylene	1330-20-7	0-7
Toluene	108-88-3	0-7
Ethylbenzene	100-41-4	0-7
Benzene	71-43-2	0-7
N-hexane	110-54-3	0-5
Naphthalene	91-20-3	0-1
Hydrogen Sulfide	7783-06-4	0-0.5

4. FIRST AID MEASURES

Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance. Remove from exposure, lie down. In case of accident or if you feel unwell, seek medical advice immediately. When symptoms persist or in all cases of doubt, seek medical advice. Never give anything by mouth to an unconscious person. Take off all contaminated clothing immediately and thoroughly wash material from skin. Immediate medical attention is required.
Inhalation	Remove to fresh air. Aspiration into lungs can produce severe lung damage. If breathing has stopped, give artificial respiration. Get medical attention immediately. Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. If breathing is difficult, (trained personnel should) give oxygen. Get immediate medical advice/attention. Delayed pulmonary edema may occur.
Eye contact	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing. Do not rub affected area. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Skin contact	Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If symptoms persist, call a physician.
Ingestion	Do NOT induce vomiting. Clean mouth with water and drink afterwards plenty of water. Never give anything by mouth to an unconscious person. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Get immediate medical advice/attention.
Self-protection of the first aider	Remove all sources of ignition. Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination. Use personal protective equipment as required. See section 8 for more information. Wear personal protective clothing (see section 8). Avoid direct contact with skin. Use barrier to give mouth-to-mouth resuscitation. Avoid contact with skin, eyes or clothing. Avoid breathing vapors or mists.

Most important symptoms and effects, both acute and delayed

Symptoms Difficulty in breathing. Coughing and/ or wheezing. Dizziness. Burning sensation.

Indication of any immediate medical attention and special treatment needed

Note to physicians Because of the danger of aspiration, emesis or gastric lavage should not be employed unless the risk is justified by the presence of additional toxic substances.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media	Dry chemical. Carbon dioxide (CO2). Water spray. Alcohol resistant foam.
Small Fire	Any extinguisher suitable for Class B fires, dry chemical, CO2, foam (AFFF/ATC), or water spray can be used.
Large Fire	Water spray, fog or alcohol-resistant foam. CAUTION: Use of water spray when fighting fire may be inefficient. Cool containers with flooding quantities of water until well after fire is out.
Unsuitable extinguishing media	CAUTION: Use of water spray when fighting fire may be inefficient.
Specific hazards arising from the chemical	Risk of ignition. Keep product and empty container away from heat and sources of ignition. In the event of fire, cool tanks with water spray. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Hazardous combustion products	Smoke, CO, and other products of incomplete combustion.
Explosion data	
Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	Yes.
Special protective equipment for fire-fighters	Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible withdraw from area and let fire burn.
Further information	ALWAYS stay away from tanks engulfed in fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Do not direct water at source of leak or safety devices; icing may occur. Cool containers with flooding quantities of water until well after fire is out. Do not allow run-off from fire-fighting to enter drains or water courses.
NFPA	Health hazards 2 Flammability 3 Stability 0 Physical and chemical properties -

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Evacuate personnel to safe areas. Use personal protective equipment as required. See section 8 for more information. Avoid contact with skin, eyes or clothing. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Pay attention to flashback. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Avoid breathing vapors or mists.

Other Information Ventilate the area. Refer to protective measures listed in Sections 7 and 8.

Environmental precautions

Environmental precautions Refer to protective measures listed in Sections 7 and 8. Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Do not touch or walk through spilled material. A vapor suppressing foam may be used to reduce vapors. Dike far ahead of spill to collect runoff water. Keep out of drains, sewers, ditches and waterways. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.

Methods for cleaning up Take precautionary measures against static discharges. Dam up. Soak up with inert absorbent material. Pick up and transfer to properly labeled containers.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling

Use personal protection equipment. Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Use grounding and bonding connection when transferring this material to prevent static discharge, fire or explosion. Use with local exhaust ventilation. Use spark-proof tools and explosion-proof equipment. Keep in an area equipped with sprinklers. Use according to package label instructions. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Do not eat, drink or smoke when using this product. Remove contaminated clothing and shoes. Take off contaminated clothing and wash before reuse. In case of insufficient ventilation, wear suitable respiratory equipment.

Conditions for safe storage, including any incompatibilities

Storage Conditions

Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity). Keep in properly labeled containers. Do not store near combustible materials. Keep in an area equipped with sprinklers. Store in accordance with the particular national regulations. Store in accordance with local regulations. Store locked up. Keep out of the reach of children. Store away from other materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL
Petroleum; Crude oil 8002-05-9	-	TWA: 500 ppm TWA: 2000 mg/m ³ (vacated) TWA: 400 ppm (vacated) TWA: 1600 mg/m ³
Xylene 1330-20-7	STEL: 150 ppm TWA: 100 ppm	TWA: 100 ppm TWA: 435 mg/m ³ (vacated) TWA: 100 ppm (vacated) TWA: 435 mg/m ³ (vacated) STEL: 150 ppm (vacated) STEL: 655 mg/m ³
Toluene 108-88-3	TWA: 20 ppm	TWA: 200 ppm (vacated) TWA: 100 ppm (vacated) TWA: 375 mg/m ³ (vacated) STEL: 150 ppm (vacated) STEL: 560 mg/m ³ Ceiling: 300 ppm
Ethylbenzene 100-41-4	TWA: 20 ppm	TWA: 100 ppm TWA: 435 mg/m ³ (vacated) TWA: 100 ppm (vacated) TWA: 435 mg/m ³ (vacated) STEL: 125 ppm (vacated) STEL: 545 mg/m ³
Benzene 71-43-2	STEL: 2.5 ppm TWA: 0.5 ppm S*	TWA: 10 ppm applies to industry segments exempt from the benzene standard at 29 CFR 1910.1028 TWA: 1 ppm (vacated) TWA: 10 ppm unless specified in 1910.1028 (vacated) STEL: 50 ppm 10 min unless specified in 1910.1028 (vacated) Ceiling: 25 ppm unless specified in 1910.1028

		Ceiling: 25 ppm STEL: 5 ppm see 29 CFR 1910.1028
N-hexane 110-54-3	TWA: 50 ppm S*	TWA: 500 ppm TWA: 1800 mg/m ³ (vacated) TWA: 50 ppm (vacated) TWA: 180 mg/m ³
Naphthalene 91-20-3	TWA: 10 ppm S*	TWA: 10 ppm TWA: 50 mg/m ³ (vacated) TWA: 10 ppm (vacated) TWA: 50 mg/m ³ (vacated) STEL: 15 ppm (vacated) STEL: 75 mg/m ³
Hydrogen Sulfide 7783-06-4	STEL: 5 ppm TWA: 1 ppm	(vacated) TWA: 10 ppm (vacated) TWA: 14 mg/m ³ (vacated) STEL: 15 ppm (vacated) STEL: 21 mg/m ³ Ceiling: 20 ppm

S* - Potential exposure by cutaneous route

NOTE: Limits shown for guidance only. For additional information, OSHA's 1989 air contaminants standard exposure limits provided even though the limits were vacated in 1992. State, local or other agencies or advisory groups may have established more stringent limits. Follow applicable regulations.

Appropriate engineering controls

Engineering controls Showers
 Eyewash stations
 Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Tight sealing safety goggles.

Hand Protection Wear suitable gloves. Impervious gloves.

Skin and body protection Wear suitable protective clothing. Long sleeved clothing. Chemical resistant apron.
Antistatic boots.

Respiratory protection When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Use a NIOSH approved respirator when there is a potential for airborne concentrations to exceed occupational exposure limits. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2, NIOSH Respirator Decision Logic, and the respirator manufacturer for additional guidance on respiratory protection selection. A Self-Contained Breathing Apparatus (SCBA) should be used for fire fighting. Use a NIOSH approved positive-pressure supplied air respirator if there is a potential for uncontrolled release, exposure levels are unknown, in oxygen deficient (less than 19.5% oxygen), or any other circumstance where an air-purifying respirator may not provide adequate protection.

General hygiene considerations Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Regular cleaning of equipment, work area and clothing is recommended. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes or clothing. Wear suitable gloves and eye/face protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical State @20°C Liquid
Appearance Liquid
Odor Petroleum asphalt
Color Yellow to black
Odor threshold Not determined

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	Not applicable	
Melting point / freezing point	~ 30 °C / 86 °F	
Boiling range	< 300 °C	
Flash point	- 7 °C / 45 °F	
Evaporation rate	No data available	
Flammability (solid, gas)	Flammable gas or vapor may be released by liquid	
Flammability Limit in Air %		
Upper flammability limit:	7	
Lower flammability limit:	0.7	
Vapor pressure	0.8 to 15.4	
Vapor density	1	
Relative density	0.9 to 1.0	
Water solubility	Negligible	
Solubility in other solvents	No data available	
Partition coefficient	2 to 6	
Autoignition temperature	No data available	
Decomposition temperature	No data available	
Kinematic viscosity	5 to 1300	
Dynamic viscosity	No data available	
Explosive properties	No data available	
Oxidizing properties	No data available	
Minimum Ignition Energy (mJ)	No data available	
K _{st} (bar.m/s)	No data available	
Softening point	No data available	
VOC Content (%)	No data available	
Density	No data available	
Bulk density	Not applicable	
Conductivity	No data available	

10. STABILITY AND REACTIVITY

Reactivity	This product is non-reactive under normal conditions.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	Heat, flames and sparks. Excessive heat.
Incompatible materials	Strong acids. Strong bases. Strong oxidizing agents.
Hazardous decomposition products	None under normal use conditions.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation	Specific test data for the substance or mixture is not available. Aspiration into lungs can produce severe lung damage. May cause pulmonary edema. Pulmonary edema can be fatal. May cause irritation of respiratory tract. Harmful by inhalation. (based on components).
Eye contact	Specific test data for the substance or mixture is not available. Irritating to eyes. (based on components). Causes serious eye irritation.
Skin contact	Repeated exposure may cause skin dryness or cracking. Specific test data for the substance or mixture is not available. Causes skin irritation. (based on components).
Ingestion	Specific test data for the substance or mixture is not available. Potential for aspiration if

swallowed. May cause lung damage if swallowed. Aspiration may cause pulmonary edema and pneumonitis. May be fatal if swallowed and enters airways. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Information on toxicological effects

Symptoms Difficulty in breathing. Coughing and/ or wheezing. Dizziness. Redness. May cause redness and tearing of the eyes.

Numerical measures of toxicity

Acute toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

ATEmix (oral) 2,453.00 mg/kg
 ATEmix (dermal) 1,646.00 mg/kg
 ATEmix (inhalation-dust/mist) 4.60 mg/l
 ATEmix (inhalation-vapor) 3,383.36 mg/l

Chemical Name	Oral LD50	LD50/dermal/rat - NO UNITS (Wizards mg/kg)	Inhalation LC50
Petroleum; Crude oil 8002-05-9	> 4300 mg/kg (Rat)	> 2000 mg/kg (Rabbit)	-
Xylene 1330-20-7	= 3500 mg/kg (Rat)	> 1700 mg/kg (Rabbit) > 4350 mg/kg (Rabbit)	= 29.08 mg/L (Rat) 4 h = 5000 ppm (Rat) 4 h
Toluene 108-88-3	= 2600 mg/kg (Rat)	= 12000 mg/kg (Rabbit)	= 12.5 mg/L (Rat) 4 h
Ethylbenzene 100-41-4	= 3500 mg/kg (Rat)	= 15400 mg/kg (Rabbit)	= 17.4 mg/L (Rat) 4 h
Benzene 71-43-2	= 1800 mg/kg (Rat) = 810 mg/kg (Rat)	> 8200 mg/kg (Rabbit)	= 44.66 mg/L (Rat) 4 h
N-hexane 110-54-3	= 25 g/kg (Rat)	= 3000 mg/kg (Rabbit)	= 48000 ppm (Rat) 4 h
Naphthalene 91-20-3	= 1110 mg/kg (Rat) = 490 mg/kg (Rat)	= 1120 mg/kg (Rabbit) > 20 g/kg (Rabbit)	> 340 mg/m ³ (Rat) 1 h
Hydrogen Sulfide 7783-06-4	-	-	= 700 mg/m ³ (Rat) 4 h

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chemical Name

Xylene

Mixed xylenes can cause skin, eye, and respiratory irritation. Both short- and long-term repeated exposures to high enough levels in humans have resulted in a variety of adverse nervous system effects that include headache, mental confusion, narcosis, equilibrium, impaired short-term memory, dizziness and tremors. Studies in laboratory animals indicate that xylene can cause changes in the liver and harmful effects on the kidneys, lungs, heart, and nervous system as well as hearing loss. The relevance of these observations to humans is not clear at this time. In general, developmental studies in animals reported adverse fetal effects only at concentrations that caused maternal toxicity. The relevance of these observations to humans is unclear at this time. The available data from in vitro and in vivo studies suggest that xylenes are not mutagenic and do not produce chromosomal abnormalities. Furthermore, rats exposed up to 500 mg/kg bw and mice exposed up to 1000 mg/kg bw mixed xylenes for 103 weeks showed no treatment-related increases in any tumor type. IARC has determined that the carcinogenicity of xylenes is not classifiable (Group 3).

Ethylbenzene

Ethylbenzene may be fatal if it is swallowed and enters the airways. Short term (acute) exposure to ethylbenzene can cause eye, skin, and throat irritation. It may have effects on the central nervous system including dizziness, and at very high exposure, lowering on consciousness. Long-term exposures orally and by inhalation have been shown to cause damage to the inner ear and hearing in animals. Long term or repeated exposure to high enough levels of ethylbenzene may have effects on the kidneys and liver, resulting in

impaired functions, and repeated contact with skin may cause dryness and cracking. Animal studies indicate some evidence of adverse effects on the liver, kidney, thyroid, and pituitary gland. In a 2-year inhalation study in mice and rats, the animals were exposed to 0, 75, 250, and 750 ppm ethylbenzene 6 hours/day, 5 days/week. Renal effects were observed in male rats (renal tubule hyperplasia) and female rats (renal tubule adenoma and adenoma or carcinoma) exposed to 750 ppm. The incidence of adenoma in the testes of males was significantly greater than in the control group and exceeded the historical control range for inhalation studies. The incidences of alveolar/bronchiolar adenoma was increased in males and the incidence of hepatocellular adenoma was increased in females. IARC has classified ethylbenzene as possibly carcinogenic to humans (Group 2B). Studies do not provide conclusive evidence of reproductive effects. In one study, developmental effects were reported in animals but only at very high doses (≥ 1000 ppm) that are likely to be toxic to the mother. The relevance of these findings to humans is not clear at this time.

Benzene

Benzene exposure may occur through inhalation, ingestion, skin absorption or eye contact. Benzene exposure can cause skin, eye and respiratory irritation. The most characteristic systemic effect resulting from high enough intermediate and chronic benzene exposure is arrested development of blood cells. Studies have linked overexposure to benzene to many hematological effects including aplastic anemia, pancytopenia, leukopenia, and myelodysplastic syndrome. In vivo and in vitro data from both humans and animals show that benzene and/or its metabolites are genotoxic. Studies in animals provide supporting evidence for the carcinogenicity of inhaled benzene. Epidemiological studies have reported a causal relationship between occupational benzene exposures and acute myelogenous leukemia. Some studies suggest associations between benzene exposure and non-Hodgkin's lymphoma, multiple myeloma, and other cancers. Benzene has been classified as carcinogenic to humans (Group 1) by IARC, and the ECHA C&L Inventory states it may cause cancer (Carc. 1B). IARC concluded that benzene causes acute myeloid leukemia and a positive association has been observed for acute lymphatic leukemia, chronic lymphatic leukemia, non-hodgkin lymphoma, and multiple myeloma. Human studies suggest that female fertility and menstrual cycles were effected by benzene exposure; however, due to uncertainties in exposure and limited data the studies were considered inconclusive. Developmental effects have been observed in animals including persistent hematopoietic anomalies. It has been suggested that the reported benzene fetotoxicity of decreased weight and skeletal variants is a function of maternal toxicity.

N-hexane

N-Hexane may be fatal if it is swallowed and enters the airways. Acute (short-term) dermal overexposure can cause skin and eye irritation in humans. Acute inhalation and oral exposures have caused systemic effects such as decreased body weight and respiratory effects, as well as reproductive and developmental effects in animals. Respiratory effects may include nose, throat, and lung irritation, coughing, wheezing, and shortness of breath. Acute overexposures may also cause headache, nausea, vomiting, dizziness, lightheadedness, loss of consciousness, coma, and death in human. Intermediate duration inhalation and oral exposures to relatively high concentrations (400-3,000 ppm) of n-hexane have led to nerve damage, paralysis, and/or deaths in rats. N-hexane may damage male reproductive glands. Intermediate-duration inhalation and oral exposure to high levels (1,000-10,000 ppm; 4,000 mg/kg/day) of n-hexane damages sperm-forming cells and testicles in rats. Chronic (long-term) inhalation of large amounts of n-hexane causes nerve damage and paralysis of the arms and legs in humans. Dermal effects, such as a skin rash, dryness, or redness can also occur following chronic overexposure. Chronic duration inhalation exposures in animals are not available.

Naphthalene

Acute (short term) exposure to large amounts of naphthalene may damage or destroy red blood cells, a condition termed hemolytic anemia. Symptoms of hemolytic anemia include fatigue, lack of appetite, restlessness, and pale skin. Acute inhalation or oral exposure to large amounts of naphthalene may also cause nausea, vomiting, diarrhea, blood in the urine, and a yellow color to the skin. Ingestion may result in death. Chronic (long term) exposure in rats and mice can lead to irritation and inflammation of their nose and lungs; nasal hyperplasia and metaplasia in respiratory and olfactory epithelium has been reported in studies in mice. Exposure to high enough levels may have effects on the blood, resulting in chronic hemolytic anemia, and effects on the eyes, resulting in the development of cataracts. Cancer from naphthalene exposure has been observed in animals, but not humans. IARC has classified naphthalene as possibly carcinogenic to humans (Group 2B), and the ECHA C&L Inventory reports that naphthalene is suspected of causing cancer (Carc. 2).

Hydrogen Sulfide

Hydrogen Sulfide may be fatal if inhaled. The nervous system and respiratory tract are the main targets of hydrogen sulfide toxicity. Short term (acute) overexposure may cause irritation to the eyes, nose or throat. At high enough levels, effects on the nervous system include headaches, poor concentration, poor memory, unconsciousness, and death. Hydrogen sulfide has a strong odor that is characteristic of rotten eggs; however, the odor is not a reliable warning property as olfactory fatigue occurs at high levels. Respiratory distress or arrest can occur at high concentrations. Direct contact of the liquid with skin can cause frostbite; contact with the eyes can cause redness or severe burns. Cardiovascular effects have also been observed. NIOSH has determined that 100 ppm is immediately dangerous to life and health.

Health hazard and classification information

Skin Corrosion/Irritation Category Classification based on data available for ingredients. Irritating to skin.

Serious eye damage/eye irritation Classification based on data available for ingredients. Irritating to eyes.
No information available.

Germ cell mutagenicity Classification based on data available for ingredients. Contains a known or suspected mutagen. The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as mutagenic.

Carcinogenicity Classification based on data available for ingredients. Contains a known or suspected carcinogen.

The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Petroleum; Crude oil 8002-05-9	A2	Group 3	Known	X
Xylene 1330-20-7	-	Group 3	-	-
Toluene 108-88-3	-	Group 3	-	-
Ethylbenzene 100-41-4	A3	Group 2B	-	X
Benzene 71-43-2	A1	Group 1	Known	X
Naphthalene 91-20-3	A3	Group 2B	Reasonably Anticipated	X

Reproductive toxicity Classification based on data available for ingredients. Contains a known or suspected reproductive toxin. The table below indicates ingredients above the cut-off threshold considered as relevant which are listed as reproductive toxins.

Target Organ Systemic Toxicant - Single Exposure No information available.

Target Organ Systemic Toxicant - Repeated Exposure Causes damage to organs through prolonged or repeated exposure.

Target organ effects liver, kidney, Respiratory system, Eyes, Skin, Central nervous system, blood, Peripheral Nervous System (PNS), bone marrow.

Aspiration hazard May be fatal if swallowed and enters airways.

12. ECOLOGICAL INFORMATION

Additional Ecological Information Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this

material that could reach any surface waters. The toll free number to the U.S. Coast Guard National Response Center is (800) 424-8802
 Very toxic to aquatic life with long lasting effects.

Ecotoxicity

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Petroleum; Crude oil 8002-05-9	-	258: 96 h <i>Salmo gairdneri</i> mg/L LC50 static	-	36: 24 h <i>Daphnia magna</i> mg/L EC50 0.26: 48 h <i>Daphnia magna</i> mg/L EC50 Static
Xylene 1330-20-7	-	13.4: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 780: 96 h <i>Cyprinus carpio</i> mg/L LC50 semi-static 780: 96 h <i>Cyprinus carpio</i> mg/L LC50 13.5 - 17.3: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 19: 96 h <i>Lepomis macrochirus</i> mg/L LC50 13.1 - 16.5: 96 h <i>Lepomis macrochirus</i> mg/L LC50 flow-through 23.53 - 29.97: 96 h <i>Pimephales promelas</i> mg/L LC50 static 30.26 - 40.75: 96 h <i>Poecilia reticulata</i> mg/L LC50 static 2.661 - 4.093: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 7.711 - 9.591: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static	-	0.6: 48 h <i>Gammarus lacustris</i> mg/L LC50 3.82: 48 h water flea mg/L EC50
Toluene 108-88-3	12.5: 72 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 static 433: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50	12.6: 96 h <i>Pimephales promelas</i> mg/L LC50 static 5.89 - 7.81: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 flow-through 15.22 - 19.05: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through 5.8: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 semi-static 11.0 - 15.0: 96 h <i>Lepomis macrochirus</i> mg/L LC50 static 50.87 - 70.34: 96 h <i>Poecilia reticulata</i> mg/L LC50 static 14.1 - 17.16: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 static 28.2: 96 h <i>Poecilia reticulata</i> mg/L LC50 semi-static 54: 96 h <i>Oryzias latipes</i> mg/L LC50 static	-	11.5: 48 h <i>Daphnia magna</i> mg/L EC50 5.46 - 9.83: 48 h <i>Daphnia magna</i> mg/L EC50 Static
Ethylbenzene 100-41-4	438: 96 h <i>Pseudokirchneriella subcapitata</i> mg/L EC50 4.6: 72 h <i>Pseudokirchneriella</i>	4.2: 96 h <i>Oncorhynchus mykiss</i> mg/L LC50 semi-static 7.55 - 11: 96 h <i>Pimephales promelas</i> mg/L LC50 flow-through	-	1.8 - 2.4: 48 h <i>Daphnia magna</i> mg/L EC50

	subcapitata mg/L EC50 1.7 - 7.6: 96 h Pseudokirchneriella subcapitata mg/L EC50 static 2.6 - 11.3: 72 h Pseudokirchneriella subcapitata mg/L EC50 static	9.6: 96 h Poecilia reticulata mg/L LC50 static 9.1 - 15.6: 96 h Pimephales promelas mg/L LC50 static 11.0 - 18.0: 96 h Oncorhynchus mykiss mg/L LC50 static 32: 96 h Lepomis macrochirus mg/L LC50 static		
Benzene 71-43-2	29: 72 h Pseudokirchneriella subcapitata mg/L EC50	10.7 - 14.7: 96 h Pimephales promelas mg/L LC50 flow-through 5.3: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 22.49: 96 h Lepomis macrochirus mg/L LC50 static 28.6: 96 h Poecilia reticulata mg/L LC50 static 22330 - 41160: 96 h Pimephales promelas µg/L LC50 static 70000 - 142000: 96 h Lepomis macrochirus µg/L LC50 static	-	10: 48 h Daphnia magna mg/L EC50 8.76 - 15.6: 48 h Daphnia magna mg/L EC50 Static
N-hexane 110-54-3	-	2.1 - 2.98: 96 h Pimephales promelas mg/L LC50 flow-through	-	1000: 24 h Daphnia magna mg/L EC50
Naphthalene 91-20-3	0.4: 72 h Skeletonema costatum mg/L EC50	5.74 - 6.44: 96 h Pimephales promelas mg/L LC50 flow-through 31.0265: 96 h Lepomis macrochirus mg/L LC50 static 0.91 - 2.82: 96 h Oncorhynchus mykiss mg/L LC50 static 1.6: 96 h Oncorhynchus mykiss mg/L LC50 flow-through 1.99: 96 h Pimephales promelas mg/L LC50 static	-	1.96: 48 h Daphnia magna mg/L EC50 Flow through 1.09 - 3.4: 48 h Daphnia magna mg/L EC50 Static 2.16: 48 h Daphnia magna mg/L LC50
Hydrogen Sulfide 7783-06-4	-	0.016: 96 h Pimephales promelas mg/L LC50 flow-through 0.0448: 96 h Lepomis macrochirus mg/L LC50 flow-through	-	0.022: 96 h Gammarus pseudolimnaeus mg/L LC50

Persistence and degradability No information available.

Bioaccumulation There is no data for this product.

Component Information

Chemical Name	Partition coefficient
Xylene 1330-20-7	2.77 - 3.15
Toluene 108-88-3	2.7
Ethylbenzene 100-41-4	3.2
Benzene 71-43-2	2.1
Naphthalene 91-20-3	3.6

Hydrogen Sulfide 7783-06-4	0.45
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Other adverse effects No information available.

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues/unused products Should not be released into the environment. Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.

Contaminated packaging Empty containers pose a potential fire and explosion hazard. Do not cut, puncture or weld containers.

US EPA Waste Number U019 U135 U165 U220 U239 D001.

Chemical Name	RCRA	RCRA - Basis for Listing	RCRA - D Series Wastes	RCRA - U Series Wastes
Xylene 1330-20-7	-	Included in waste stream: F039	-	U239
Toluene 108-88-3	U220	Included in waste streams: F005, F024, F025, F039, K015, K036, K037, K149, K151	-	U220
Ethylbenzene 100-41-4	-	Included in waste stream: F039	-	-
Benzene 71-43-2	U019	Included in waste streams: F005, F024, F025, F037, F038, F039, K085, K104, K105, K141, K142, K143, K144, K145, K147, K151, K159, K169, K171, K172	0.5 mg/L regulatory level	U019
Naphthalene 91-20-3	U165	Included in waste streams: F024, F025, F034, F039, K001, K035, K060, K087, K145	-	U165
Hydrogen Sulfide 7783-06-4	U135	-	-	U135

Chemical Name	RCRA - Halogenated Organic Compounds	RCRA - P Series Wastes	RCRA - F Series Wastes	RCRA - K Series Wastes
Toluene 108-88-3	-	-	Toxic waste waste number F025 Waste description: Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine	-

Naphthalene 91-20-3	-	-	substitution. Toxic waste waste number F025 Waste description: Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	-
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California Hazardous Waste Status This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste Status
Xylene 1330-20-7	Toxic Ignitable
Toluene 108-88-3	Toxic Ignitable
Ethylbenzene 100-41-4	Toxic Ignitable
Benzene 71-43-2	Toxic Ignitable
N-hexane 110-54-3	Toxic Ignitable
Naphthalene 91-20-3	Toxic

14. TRANSPORT INFORMATION

DOT Not regulated

TDG Not regulated

MEX Not regulated

IATA Not regulated
UN/ID no 1267
Packing group 1

IMDG Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA Listed

DSL/NDSL Listed

ENCS Not Listed

IECSC Listed

KECL Listed
 PICCS Listed
 AICS Listed

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
 DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List
 ENCS - Japan Existing and New Chemical Substances
 IECSC - China Inventory of Existing Chemical Substances
 KECL - Korean Existing and Evaluated Chemical Substances
 PICCS - Philippines Inventory of Chemicals and Chemical Substances
 AICS - Australian Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute health hazard Yes
 Chronic Health Hazard Yes
 Fire hazard Yes
 Sudden release of pressure hazard No
 Reactive Hazard No

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42).

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Xylene 1330-20-7	100 lb	-	-	X
Toluene 108-88-3	1000 lb	X	X	X
Ethylbenzene 100-41-4	1000 lb	X	X	X
Benzene 71-43-2	10 lb	X	X	X
Naphthalene 91-20-3	100 lb	X	X	X
Hydrogen Sulfide 7783-06-4	100 lb	-	-	X

CERCLA

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil, fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

US State Regulations

California Proposition 65

This product contains the following Proposition 65 chemicals.

Chemical Name	California Proposition 65
Ethylbenzene - 100-41-4	Carcinogen
Toluene - 108-88-3	Developmental
Benzene - 71-43-2	Carcinogen Developmental Male Reproductive

Naphthalene - 91-20-3	Carcinogen
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U.S. State Right-to-Know Regulations

US State Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Petroleum; Crude oil 8002-05-9	X	X	X
Ethylbenzene 100-41-4	X	X	X
Toluene 108-88-3	X	X	X
Xylene 1330-20-7	-	-	X
Benzene 71-43-2	X	X	X
N-hexane 110-54-3	X	X	X
Naphthalene 91-20-3	X	X	X
Hydrogen Sulfide 7783-06-4	X	X	X

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

Revision Date 07-Mar-2018
Revision Note No information available.

Disclaimer

Tesoro Companies, Inc. (Tesoro) provides the information on this Safety Data Sheet (SDS) in order to meet its obligations under 29 CFR 1910.1200, and does not hereby make any guarantee of product specifications or suitability for any particular purpose. Tesoro does not assume any liability arising out of the use of Tesoro's product or the use of information provided on this SDS. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all relevant information in the format of this document, since additional information may be necessary under exceptional conditions of use, and since Tesoro prepared this SDS based on information available on the date of its publication.

End of Safety Data Sheet



SAFETY DATA SHEET

1. IDENTIFICATION

1.1 Product identifier

Product name: Biodiesel
Synonym(s): #1 Bio-Diesel, #2 Bio-Diesel, Fatty Acid Methyl Esters (FAME)
CAS #: 67784-80-9

1.2 Recommended use of the chemical and restrictions on use

Recommended use: Blend component in diesel, fuel
Restrictions: Other uses are not recommended

1.3 Details of the supplier of the safety data sheet

Company Identification: Idemitsu Apollo Corporation
1831 16th Street
Sacramento, CA 95811
Telephone: (916) 443-0890
Fax: (916) 443-0895
Email: Ops@idemitsuapollo.com

1.4 Emergency telephone number

Emergency Phone No. (24h): Chemtrec: 1-800-424-9300

2. HAZARD(S) IDENTIFICATION

2.1 Classification of the substance or mixture

Classification (GHS-US)

Hazard Not Otherwise Specified, Skin irritation, Category 3

GHS-US labeling

Hazard Pictograms (GHS-US) No Symbol
Signal word (GHS-US) **Warning**
Hazard statements (GHS-US) **Causes mild skin irritation**
Precautionary statements (GHS-US) Response: If skin irritation occurs, get medical advice/attention.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS #	Percent
Biodiesel B100	67784-80-9	100

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4. FIRST AID MEASURES

4.1. Description of first aid measures	Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures general	
First-aid measures after inhalation	Move victim to fresh air. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get medical attention.
First-aid measures after skin contact	Immediately remove contaminated clothing or shoes, wipe excess from skin and flush with plenty of water for at least 15 minutes. Do not reuse clothing until thoroughly cleaned. Cover irritated skin with emollient. For serious skin exposure, wash with disinfectant soap and cover contaminated skin with an antibacterial cream. Get medical attention if irritation persists.
First-aid measures after eye contact	Immediately flush with large amounts of water, holding eyelids open, for at least 15 minutes. Repeat if necessary. Remove contact lenses, if present and easy to do. Seek medical assistance if irritation persists.
First-aid measures after ingestion	Do not induce vomiting. Have exposed individual rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Consult a medical professional if symptoms persist.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation	Vapors or finely misted materials may irritate mucous membranes and cause irritation, dizziness, and nausea
Symptoms after ingestion	Symptoms/injuries after ingestion. Not likely to be toxic from ingestion.

4.3 Indication of any immediate medical attention and special treatment needed

No additional information available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media	Carbon dioxide, dry chemical, water spray, or regular foam.
Unsuitable extinguishing media	Do not use straight water stream.

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5.2 Special hazards arising from the chemical

Fire hazards

Biodiesel soaked rags or spill absorbents (i.e. oil dry, polypropylene socks, sand, etc.) can cause spontaneous combustion if stored near combustibles and not handled properly. Store biodiesel soaked rags or spill absorbents in approved safety containers and dispose of properly. Oil soaked rags may be washed with soap and water and allowed to dry in well-ventilated area.

5.3 Advice for firefighters

Firefighting instructions

Move containers from fire area if you can do it without risk. Dike fire-control water for later disposal; do not scatter the material. Do not get water inside containers. Use water spray or fog; do not use straight streams. Note: use of water spray when fighting fire may be inefficient or cause a chemical reaction. Persons involved in firefighting response involving this product and its containers/packaging should refer to Section 8 of this SDS for the proper selection of exposure controls and personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Emergency procedures for non-emergency personnel

Small spill: For emergency information and procedures to follow in the case of an accidental release, call the Emergency Telephone Number(s) listed in Section 1 of this SDS. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 50 meters (150 feet) in all directions. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. Absorb or cover with dry earth, sand or other non-combustible material and transfer to suitable containers. Use clean non-sparking tools to collect absorbed material. Wash hard surfaces with safety solvent or detergent to remove remaining film.

Emergency procedures for emergency responders

Large spill: Dike far ahead of liquid spill for later disposal. Consider initial downwind evacuation for at least 800 meters (1/2 mile). Do not release into sewers or waterways.

6.2 Methods and materials for containment and cleaning up

Methods for cleaning up

Soak up spills with inert solids, such as clay or diatomaceous earth as soon as possible. Collect spillage. Store away from other materials.

6.3 References to other sections

See section 8. Exposure controls/personal protection.

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7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Additional hazards when processed	None known.
Precautions for safe handling	Wear appropriate personal protective equipment and use exposure controls as indicated in Section 8 of this SDS. Keep away from heat and sources of ignition. Do not weld, heat or drill container. Do not get in eyes, on skin, or on clothing. Do not breathe vapors or mists. Remove contaminated clothing immediately. Do not wear contaminated clothing or shoes. Wash with soap and water after working with this product.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures	Provide adequate general and local exhaust ventilation to meet exposure limit requirements. Provide readily accessible eye wash stations and emergency showers. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.
Storage conditions	Keep in airtight container away from all heat sources. Store in a segregated and approved area. Store in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep container in a well-ventilated area. Store away from incompatible materials. Store in the original container or an approved alternative made from compatible material. Do not store in unlabeled containers. Treat empty containers in a similar fashion as residual product may exist. Use appropriate containment to avoid environmental contamination.
Incompatible products	Strong oxidizers.
Incompatible materials	Sources of ignition. Direct sunlight. Heat sources.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Occupational exposure guidelines

Substance	Applicable Workplace Exposure Levels
Fatty Acid, Methyl Ester	OSHA (United States) TWA: N/E OSHA (United States) STEL: N/E

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	ACGIH (United States) TWA: N/E ACGIH (United States) STEL: N/E
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8.2 Exposure controls

Appropriate engineering controls	Ensure adequate ventilation
Personal protective equipment	Avoid all unnecessary exposure
Hand protection	Chemically impervious gloves, rubber boots, and apron should be worn when working with this material. PVC coated gloves recommended to prevent skin contact.
Eye protection	Employees are recommended to use safety goggles, chemical goggles and/or full-face splash shields where there is any possibility of product coming in contact with eyes. Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of contact lenses. Ensure that an eye wash station is operable and nearby.
Respiratory protection	Breathing apparatus needed only when aerosol or mist is formed. Observe respirator assigned protection factors (APFs) criteria cite in federal OSHA 1910.134.
Other information	Do not eat, drink or smoke during use.

9. PHYSICAL & CHEMICAL PROPERTIES

9.1 Basic physical and chemical properties

Physical state:	Liquid
Color:	Amber/pale yellow liquid.
Odor:	Slight
Specific gravity:	0.88 (Water=1)
pH:	Neutral
Vapor density:	>1 (Air=1)
Boiling point:	200 °C
Melting/freezing point:	Not determined
Vapor pressure:	<2 mmHg
Volatility:	Low
Solubility in water:	Insoluble
Viscosity (cSt @40°C):	Not determined
Flash point:	Closed cup >230 °C. (Estimated)
Additional properties:	No additional information.

10. STABILITY & REACTIVITY

10.1 Reactivity

Stable.

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10.2 Chemical stability

The product is stable at normal handling and storage conditions.

10.3 Possibility of hazardous reactions

Under normal conditions of storage and use, hazardous polymerization will not occur.

10.4 Conditions to avoid

Extreme heat.

10.5 Incompatible materials

Strong oxidizing agents.

10.6 Hazardous decomposition products

Carbon oxides and smoke.

11. TOXICOLOGICAL INFORMATION

For other health-related information, refer to the Hazards Identification in Section 2 and the First Aid in Section 4.

11.1 Information on toxicological effects

Likely routes of exposure	: Eye contact. Skin contact. Ingestion. Inhalation.
Acute toxicity	: Not classified.
Skin corrosion/irritation	: May cause skin irritation.
Serious eye damage/irritation	: Not classified.
Respiratory or skin sensitization	: No acute effects expected from routine operations. Overheating of product may produce vapors. Vapors or finely misted materials may irritate mucous membranes and cause irritation, dizziness, and nausea.
Germ cell mutagenicity	: Not anticipated to be mutagenic.
Carcinogenicity	: Not classified.

Fatty Acid, Methyl Ester (FAME)	
LD50 Oral Rat	N/E
LD50 Dermal Rabbit	N/E
LC50 Inhalation rat	N/E

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Reproductive toxicity	Not classified.
Specific target organ toxicity (single exposure)	Not classified.
Specific target organ toxicity (repeated exposure)	Not classified.
Aspiration hazard	No acute effects expected from routine operations. Overheating of product may produce vapors. Vapors or finely misted materials may irritate mucous membranes and cause irritation, dizziness, and nausea.
Potential adverse human health effects and symptoms	Not classified.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Fatty Acid, Methyl Ester (CAS 67784-80-9)

: Not established

12.2 Persistence and degradability

Fatty Acid, Methyl Ester (CAS 67784-80-9)

Persistence and degradability

: Expected to be readily biodegradable under aerobic conditions.

12.3 Bioaccumulative potential

Fatty Acid, Methyl Ester (CAS 67784-80-9)

Bioaccumulative potential

: Not expected to bioaccumulate in aquatic organisms.

12.4 Mobility in soil

Fatty Acid, Methyl Ester (CAS 67784-80-9)

: Insoluble and floats on water. May partition into air, soil and water.

12.5 Other adverse effects

Other information

: No information available.

13. DISPOSAL CONSIDERATIONS

Hazard characteristics and regulatory waste stream classification can change with product use. Accordingly, it is the responsibility of the user to determine the proper storage, transportation, treatment, and/or disposal methodologies for spent materials and residues at the time of disposition.



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13.1 Waste treatment methods

Waste disposal recommendations

The user is responsible for determining if any discarded material is a hazardous waste (40 CFR 262.11). Dispose of in accordance with federal, state and local regulations.

Additional information

Long-term storage may result in decomposition of the oil and could result in a rancid odor.

14. TRANSPORT INFORMATION

14.1	UN Number	Not regulated
14.2	Proper Shipping Name	Not applicable
14.3	Transport hazard class(es)	Not applicable
14.4	Packing Group	Not applicable
14.5	Environmental hazards	ADR/RID/AND/IATA: No IMDG: No
14.6	Special precautions for user	Not applicable
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. REGULATORY INFORMATION

TSCA Inventory	This product and/or its components are listed on the Toxic Substance Control Act (TSCA) inventory, or are not required to be listed in the TSCA inventory.
SARA 311/312 Hazard Identification	The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III requires facilities subject to this subpart to submit aggregate information on chemicals by "Hazard Category" as defined in 40 CFR 370.2. This material would be classified under the following hazard categories: This product and/or its components are not regulated under SARA section 311/312.
California Proposition 65	This product is not known to contain any components for which the state of California has found to cause cancer, birth defects, or other reproductive harm.

16. OTHER INFORMATION

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NFPA (National Fire Protection Association)

NFPA Health hazard	0
NFPA Fire Hazard	1
NFPA Reactivity	0

HMIS III Rating

Health	0
Flammability	1
Physical Hazard	0
Personal Protection	See section 8 of SDS

Disclaimer:

Information given herein is offered in good faith as accurate, but without guarantee. Conditions of use and suitability of the product for particular uses are beyond our control; all risks of use of the product are therefore assumed by the user and WE EXPRESSLY DISCLAIM ALL WARRANTIES OF EVERY KIND AND NATURE, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE IN RESPECT TO THE USE OR SUITABILITY OF THE PRODUCT. Nothing is intended as a recommendation for uses which infringe valid patents or as extending license under valid patents. Appropriate warnings and safe handling procedures should be provided to handlers and users. Alteration of this document is strictly prohibited. Vitol Inc. assumes no responsibility for accuracy of information.

SAFETY DATA SHEET



Denatured Ethanol

Section 1. Identification

GHS product identifier : Denatured Ethanol
Chemical name : Ethyl alcohol, Denatured
Synonyms : Alcohol; Denatured Alcohol; Ethanol; Anhydrol
Code : 03201
MSDS # : 03201

Supplier's details : CITGO Petroleum Corporation
P.O. Box 4689
Houston, TX 77210
sdsvend@citgo.com

Emergency telephone number : Technical Contact: (800) 248-4684
Medical Emergency: (832) 486-4700
CHEMTREC Emergency: (800) 424-9300
(United States Only)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Classification of the substance or mixture : FLAMMABLE LIQUIDS - Category 2
SKIN CORROSION/IRRITATION - Category 2
SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
GERM CELL MUTAGENICITY - Category 1B
CARCINOGENICITY - Category 1A
TOXIC TO REPRODUCTION [Unborn child] - Category 2
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) [Respiratory tract irritation] - Category 3
ASPIRATION HAZARD - Category 1

GHS label elements

Hazard pictograms :



Signal word :

Danger

Hazard statements :

Highly flammable liquid and vapor.
Causes serious eye irritation.
Causes skin irritation.
May cause genetic defects.
May cause cancer.
Suspected of damaging the unborn child.
May be fatal if swallowed and enters airways.
May cause respiratory irritation.

Precautionary statements

Prevention :

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Wear protective gloves. Wear eye or face protection. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Use explosion-proof electrical, ventilating, lighting and all material-handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling.

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Section 2. Hazards identification

- Response** : IF exposed or concerned: Get medical attention. IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. IF SWALLOWED: Immediately call a POISON CENTER or physician. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs: Get medical attention. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical attention.
- Storage** : Store locked up. Store in a well-ventilated place. Keep cool.
- Disposal** : Dispose of contents and container in accordance with all local, regional, national and international regulations.
- Hazards not otherwise classified** : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Chemical name** : Ethyl alcohol, Denatured
- Other means of identification** : Alcohol; Denatured Alcohol; Ethanol; Anhydrol

CAS number/other identifiers

- CAS number** : Mixture

Ingredient name	%	CAS number
Ethyl alcohol, Denatured	100	Mixture
Ethanol	60 - 100	64-17-5
Toluene	0.1 - 1	108-88-3
Xylenes, mixed isomers	0.1 - 1	1330-20-7
Benzene	0.1 - 1	71-43-2
n-Hexane	0.1 - 1	110-54-3

* = Various ** = Mixture *** = Proprietary

Any concentration shown as a range is to protect confidentiality or is due to process variation.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that gas or vapor is still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.



Section 4. First aid measures

- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Aspiration hazard if swallowed. Can enter lungs and cause damage. Do not induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute

Potential acute health effects

- Eye contact** : Causes eye irritation. Causes serious eye irritation.
Inhalation : May cause respiratory irritation.
Skin contact : Causes skin irritation.
Ingestion : May be fatal if swallowed and enters airways.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
 pain or irritation
 watering
 redness
- Inhalation** : Adverse symptoms may include the following:
 respiratory tract irritation
 coughing
- Skin contact** : Adverse symptoms may include the following:
 irritation
 redness
- Ingestion** : Adverse symptoms may include the following:
 nausea or vomiting

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : If ingested, this material presents a significant aspiration and chemical pneumonitis hazard. Induction of emesis is not recommended. Consider activated charcoal and/or gastric lavage. If patient is obtunded, protect the airway by cuffed endotracheal intubation or by placement of the body in a Trendelenburg and left lateral decubitus position.
- Specific treatments** : Treat symptomatically and supportively.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that gas or vapor is still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

- Specific hazards arising from the chemical** : Highly flammable liquid and vapor. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. The vapor/gas is heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back. Runoff to sewer may create fire or explosion hazard. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Extinguishing media

- Suitable extinguishing media** : Use dry chemical, CO₂, water spray (fog) or alcohol foam.



Section 5. Fire-fighting measures

- Unsuitable extinguishing media** : Do not use water jet.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and materials for containment and cleaning up

- Small spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not swallow. Avoid breathing vapor or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers

Section 7. Handling and storage

retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Bulk Storage Conditions: Maintain all storage tanks in accordance with applicable regulations. Use necessary controls to monitor tank inventories. Inspect all storage tanks on a periodic basis. Test tanks and associated piping for tightness. Maintain the automatic leak detection devices to assure proper working condition.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Ethanol	<p>ACGIH (United States). TWA: 1000 ppm 8 hours.</p> <p>OSHA (United States). TWA: 1000 ppm 8 hours.</p> <p>ACGIH TLV (United States, 4/2014). STEL: 1000 ppm 15 minutes.</p> <p>OSHA PEL (United States, 2/2013). TWA: 1000 ppm 8 hours.</p>
Xylenes, mixed isomers	<p>TWA: 1900 mg/m³ 8 hours.</p> <p>ACGIH TLV (United States, 4/2014). TWA: 100 ppm 8 hours. TWA: 434 mg/m³ 8 hours. STEL: 150 ppm 15 minutes. STEL: 651 mg/m³ 15 minutes.</p> <p>OSHA PEL (United States, 2/2013). TWA: 100 ppm 8 hours. TWA: 435 mg/m³ 8 hours.</p>
Toluene	<p>OSHA PEL Z2 (United States, 2/2013). TWA: 200 ppm 8 hours. CEIL: 300 ppm AMP: 500 ppm 10 minutes.</p> <p>ACGIH TLV (United States, 4/2014). TWA: 20 ppm 8 hours.</p>
Benzene	<p>ACGIH TLV (United States, 4/2014). Absorbed through skin. TWA: 0.5 ppm 8 hours. TWA: 1.6 mg/m³ 8 hours. STEL: 2.5 ppm 15 minutes. STEL: 8 mg/m³ 15 minutes.</p> <p>OSHA PEL (United States, 2/2013). TWA: 1 ppm 8 hours. STEL: 5 ppm 15 minutes.</p> <p>OSHA PEL Z2 (United States, 2/2013). TWA: 10 ppm 8 hours. CEIL: 25 ppm AMP: 50 ppm 10 minutes.</p>

Section 8. Exposure controls/personal protection

n-Hexane

ACGIH TLV (United States, 4/2014). Absorbed through skin.

TWA: 50 ppm 8 hours.

OSHA PEL (United States, 2/2013).

TWA: 500 ppm 8 hours.

TWA: 1800 mg/m³ 8 hours.

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, vapor controls, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety glasses equipped with side shields are recommended as minimum protection in industrial settings. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Splash goggles. Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. chemical splash goggles. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Avoid skin contact with liquid. Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Leather boots are not protective for liquid contact.

Respiratory protection : Avoid inhalation of gases, vapors, mists or dusts. Use a properly fitted, air-purifying or supplied-air respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Section 9. Physical and chemical properties

Physical state : Liquid.

Color : Colorless.

Odor : Mild characteristic odor. [Slight]

pH : 6 to 7

Melting point : -160 to 13°C (-256 to 55.4°F)

Boiling point/boiling range : 78.5°C (173.3°F)

Section 9. Physical and chemical properties

Flash point	: Closed cup: 13°C (55.4°F) [Estimated]
Evaporation rate	: 1.9 (butyl acetate = 1)
Lower and upper explosive (flammable) limits	: Lower: 1.3% Upper: 19%
Vapor pressure	: 5.9 kPa (43.9 mm Hg) [room temperature]
Vapor density	: 1.6 [Air = 1]
Relative density	: 0.8
Density lbs/gal	: Estimated 6.67 lbs/gal
Gravity, °API	: Estimated 45 @ 60 F
Auto-ignition temperature	: >316°C (>600.8°F)
Viscosity	: Kinematic (40°C (104°F)): 0.001 to 0.005 cm ² /s (0.1 to 0.5 cSt)
Viscosity SUS	: <0.5 SUS @100 F

Section 10. Stability and reactivity

Reactivity	: Not expected to be Explosive, Self-Reactive, Self-Heating, or an Organic Peroxide under US GHS Definition(s).
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Ethanol	LC50 Inhalation Vapor	Mouse	>40000 ppm	10 minutes
	LC50 Inhalation Vapor	Rat	124700 mg/m ³	4 hours
	LD50 Oral	Guinea pig	5560 mg/kg	-
	LD50 Oral	Rabbit	6300 mg/kg	-
	LD50 Oral	Rat	7060 mg/kg	-
Xylenes, mixed isomers	LC50 Inhalation Vapor	Rat	5000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	6700 ppm	4 hours
	LD50 Oral	Mouse	2119 mg/kg	-
	LD50 Oral	Rat	4300 mg/kg	-
	LD50 Oral	Rat	4300 mg/kg	-
Toluene	LC50 Inhalation Vapor	Rat	>20 mg/l	4 hours
	LD50 Dermal	Rabbit	12267 mg/kg	-
	LD50 Oral	Rat - Male	5580 mg/kg	-
Benzene	TDLo Oral	Rat	1000 mg/kg	-
	LC50 Inhalation Vapor	Rat	10000 ppm	7 hours
	LD50 Oral	Mammal - species unspecified	5700 mg/kg	-
	LD50 Oral	Mouse	4700 mg/kg	-

Section 11. Toxicological information

n-Hexane	LD50 Oral LC50 Inhalation Vapor LD50 Oral	Rat Rat Rat	6400 mg/kg 48000 ppm 15840 mg/kg	- 4 hours -
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Conclusion/Summary : **Ethanol:** Inhalation exposure to ethanol vapor at concentrations above applicable workplace exposure levels is expected to produce eye and mucus membrane irritation. Human exposure at concentrations from 1000 to 5000 ppm produced symptoms of narcosis, stupor and unconsciousness. Subjects exposed to ethanol vapor in concentrations between 500 and 10,000 ppm experienced coughing and smarting of the eyes and nose. At 15,000 ppm there was continuous lacrimation and coughing. While extensive acute and chronic effects can be expected with ethanol consumption, ingestion is not expected to be a significant route of exposure to this product.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Ethanol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	0.06666667 minutes 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	100 microliters	-
	Skin - Mild irritant	Rabbit	-	400 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
Xylenes, mixed isomers	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Moderate irritant	Rabbit	-	24 hours 500 milligrams	-
Toluene	Skin - Moderate irritant	Rabbit	-	100 Percent	-
	Eyes - Mild irritant	Rabbit	-	0.5 minutes 100 milligrams	-
	Eyes - Mild irritant	Rabbit	-	870 Micrograms	-
	Skin - Mild irritant	Pig	-	24 hours 250 microliters	-
	Skin - Mild irritant	Rabbit	-	435 milligrams	-
Benzene	Skin - Moderate irritant	Rabbit	-	500 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	88 milligrams	-
	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
n-Hexane	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-
	Eyes - Mild irritant	Rabbit	-	10 milligrams	-

Skin : No additional information.

Eyes : No additional information.

Respiratory : No additional information.

Sensitization

Skin : No additional information.

Respiratory : No additional information.

Mutagenicity

Conclusion/Summary : No additional information.

Carcinogenicity

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
Benzene	Positive - Inhalation - TD	Rat - Female	-	-

Conclusion/Summary : No additional information.

Classification

Product/ingredient name	OSHA	IARC	NTP
Ethanol	-	1	-
Toluene	-	3	-
Xylenes, mixed isomers	-	3	-
Benzene	+	1	Known to be a human carcinogen.

Reproductive toxicity

Conclusion/Summary : No additional information.

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
Benzene	Negative - Inhalation	Rat	-	-

Conclusion/Summary : No additional information.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Ethyl alcohol, Denatured	Category 3	Not applicable.	Respiratory tract irritation
Ethanol	Category 3	Not applicable.	Respiratory tract irritation
Toluene	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
n-Hexane	Category 3	Not applicable.	Narcotic effects

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Xylenes, mixed isomers	Category 2	Not determined	hearing organs
Toluene	Category 2	Inhalation	central nervous system (CNS)
Benzene	Category 1	Inhalation	blood system
n-Hexane	Category 2	Inhalation	peripheral nervous system

Aspiration hazard

Name	Result
Ethyl alcohol, Denatured	ASPIRATION HAZARD - Category 1
Toluene	ASPIRATION HAZARD - Category 1
Benzene	ASPIRATION HAZARD - Category 1
n-Hexane	ASPIRATION HAZARD - Category 1

Information on the likely routes of exposure : Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

- Eye contact** : Causes eye irritation. Causes serious eye irritation.
- Inhalation** : May cause respiratory irritation.
- Skin contact** : Causes skin irritation.
- Ingestion** : May be fatal if swallowed and enters airways.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

- Eye contact** : Adverse symptoms may include the following:
 pain or irritation
 watering
 redness
- Inhalation** : Adverse symptoms may include the following:
 respiratory tract irritation
 coughing
- Skin contact** : Adverse symptoms may include the following:
 irritation
 redness
- Ingestion** : Adverse symptoms may include the following:
 nausea or vomiting

Potential chronic health effects

- General** : No known significant effects or critical hazards.
- Carcinogenicity** : May cause cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenicity** : May cause genetic defects.
- Teratogenicity** : Suspected of damaging the unborn child.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Ethanol	Acute EC50 17.921 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Acute EC50 2000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 25500 µg/l Marine water	Crustaceans - Artemia franciscana - Larvae	48 hours
	Acute LC50 42000 µg/l Fresh water	Fish - Oncorhynchus mykiss	4 days
	Chronic NOEC 4.995 mg/l Marine water	Algae - Ulva pertusa	96 hours
	Chronic NOEC 0.375 µl/l Fresh water	Fish - Gambusia holbrooki - Larvae	12 weeks
	Xylenes, mixed isomers	Acute EC50 90 mg/l Fresh water	Crustaceans - Cypris subglobosa
Acute LC50 8.5 ppm Marine water		Crustaceans - Palaemonetes pugio - Adult	48 hours
Acute LC50 8500 µg/l Marine water		Crustaceans - Palaemonetes pugio	48 hours
Acute LC50 15700 µg/l Fresh water		Fish - Lepomis macrochirus - Juvenile (Fledgling, Hatchling, Weanling)	96 hours
Acute LC50 19000 µg/l Fresh water		Fish - Lepomis macrochirus	96 hours
Acute LC50 13400 µg/l Fresh water		Fish - Pimephales promelas	96 hours
Acute LC50 16940 µg/l Fresh water		Fish - Carassius auratus	96 hours
Toluene	Acute EC50 12500 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 11600 µg/l Fresh water	Crustaceans - Gammarus pseudolimnaeus - Adult	48 hours
	Acute EC50 6000 µg/l Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute LC50 5500 µg/l Fresh water	Fish - Oncorhynchus kisutch - Fry	96 hours
Benzene	Chronic NOEC 1000 µg/l Fresh water	Daphnia - Daphnia magna	21 days
	Acute EC50 29000 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 1600000 µg/l Fresh water	Algae - Selenastrum sp.	96 hours

Section 12. Ecological information

n-Hexane	Acute EC50 9230 µg/l Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 21000 µg/l Marine water	Crustaceans - Artemia salina - Nauplii	48 hours
	Acute LC50 5.28 ul/L Fresh water	Fish - Oncorhynchus gorbuscha - Fry	96 hours
	Chronic NOEC 98 mg/l Fresh water	Daphnia - Daphnia magna	21 days
	Chronic NOEC 1.5 to 5.4 ul/L Marine water	Fish - Morone saxatilis - Juvenile (Fledgling, Hatchling, Weanling)	4 weeks
	Acute LC50 2500 µg/l Fresh water	Fish - Pimephales promelas	96 hours

Conclusion/Summary : Not available.

Persistence and degradability

Conclusion/Summary : Not available.

Product/Ingredient name	Aquatic half-life	Photolysis	Biodegradability
Toluene	-	-	Readily
Benzene	-	-	Readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Ethanol	-0.35	-	low
Xylenes, mixed isomers	3.12	8.1 to 25.9	low
Toluene	2.73	8.3	low
Benzene	2.13	4.27	low
n-Hexane	4	501.187	high

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations





Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

RCRA classification : D001, D018

Section 14. Transport information

11

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	UN1987	UN 1987	UN 1987
UN proper shipping name	UN 1987, Alcohol, n.o.s. (Ethanol, Gasoline), 3, PG II	UN 1987, Alcohol, n.o.s. (Ethanol, Gasoline), 3, PG II	UN 1987, Alcohol, n.o.s. (Ethanol, Gasoline), 3, PG II
Transport hazard class(es)	3 	3  	3 
Packing group	II	II	II
Environmental hazards	No.	Yes.	No.
Additional information	<p>Packaging instruction Passenger aircraft Quantity limitation: 5 L Packaging instructions: 202</p> <p>Cargo aircraft Quantity limitation: 60 L Packaging instructions: 202</p>	-	<p>Cargo Aircraft OnlyQuantity limitation: 60 L Packaging instructions: 307 Limited Quantities - Passenger AircraftQuantity limitation: 5 L Packaging instructions: 305</p>

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Section 15. Regulatory information

U.S. Federal regulations : **United States inventory (TSCA 8b):** All components are listed or exempted.
Clean Water Act (CWA) 307: Toluene; Benzene; Ethylbenzene; Naphthalene
Clean Water Act (CWA) 311: Xylenes, mixed isomers; Toluene; Benzene; Ethylbenzene; Cyclohexane; Naphthalene
 This material is classified as an oil under Section 311 of the Clean Water Act (CWA) and the Oil Pollution Act of 1990 (OPA). Discharges or spills which produce a visible sheen on waters of the United States, their adjoining shorelines, or into conduits leading to surface waters must be reported to the EPA's National Response Center at (800) 424-8802.

SARA 302/304

Composition/information on ingredients

SARA 304 RQ : Not applicable.

SARA 311/312

Classification : Fire hazard
 Immediate (acute) health hazard
 Delayed (chronic) health hazard

Composition/information on ingredients

Séction 15. Regulatory information

Name	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Ethyl alcohol, Denatured	Yes.	No.	No.	Yes.	Yes.
Ethanol	Yes.	No.	No.	Yes.	Yes.
Xylenes, mixed isomers	Yes.	No.	No.	Yes.	Yes.
Toluene	Yes.	No.	No.	Yes.	Yes.
Benzene	Yes.	No.	No.	Yes.	Yes.
n-Hexane	Yes.	No.	No.	Yes.	Yes.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Benzene	71-43-2	<1
Supplier notification	Benzene	71-43-2	<1

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

- Massachusetts** : The following components are listed: ETHYL ALCOHOL
New York : The following components are listed: Benzene
New Jersey : The following components are listed: Ethyl alcohol, Denatured
Pennsylvania : The following components are listed: Ethyl alcohol, Denatured

California Prop. 65

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Ingredient name	%	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
Ethanol	<99	Yes.	Yes.	No.	No.
Toluene	<1	No.	Yes.	No.	7000 µg/day (ingestion)
Benzene	<1	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day (inhalation)	24 µg/day (ingestion) 49 µg/day (inhalation)
Ethylbenzene	<1	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
Cumene	<1	Yes.	No.	No.	No.
Naphthalene	<0.1	Yes.	No.	Yes.	No.

International regulations

- International lists** :
- Australia inventory (AICS):** All components are listed or exempted.
 - China inventory (IECSC):** All components are listed or exempted.
 - Japan inventory:** All components are listed or exempted.
 - Korea inventory:** All components are listed or exempted.
 - Malaysia Inventory (EHS Register):** All components are listed or exempted.
 - New Zealand Inventory of Chemicals (NZIoC):** All components are listed or exempted.
 - Philippines Inventory (PICCS):** All components are listed or exempted.
 - Taiwan inventory (CSNN):** All components are listed or exempted.
- Canada inventory** : All components are listed or exempted.
EU Inventory : All components are listed or exempted.
WHMIS (Canada) :
- Class B-2: Flammable liquid
 - Class D-2A: Material causing other toxic effects (Very toxic).
 - Class D-2B: Material causing other toxic effects (Toxic).

Section 16. Other information

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of issue/Date of revision : 12/2/2015

Key to abbreviations : ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 IATA = International Air Transport Association
 IBC = Intermediate Bulk Container
 IMDG = International Maritime Dangerous Goods
 LogPow = logarithm of the octanol/water partition coefficient
 MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
 UN = United Nations

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SAFETY DATA SHEET

Aviation Jet Fuel JET A-1 (JETA1)

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name	Aviation Jet Fuel JET A-1 (JETA1)
Product number	ID 10505
Internal identification	145163

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Distribution of substance (ES01a) Formulation & (re)packing of substances and mixtures (ES02) Use as a fuel (ES12a, ES12b)
Uses advised against	Consumer Professional use. Uses in coatings Use in cleaning agents Lubricants Metal working fluids/rolling oils Use as binders and release agents Use in agrochemicals Road and construction applications Explosives manufacture & use

1.3. Details of the supplier of the safety data sheet

Supplier	Neste Oyj Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND Tel. +358 10 45811 SDS@neste.com (chemical safety)
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1.4. Emergency telephone number

National emergency telephone +358-9-471 977, +358-9-4711, Poison Information Centre number

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards	Flam. Liq. 3 - H226
Health hazards	Skin Irrit. 2 - H315 STOT SE 3 - H336 Asp. Tox. 1 - H304
Environmental hazards	Aquatic Chronic 2 - H411

2.2. Label elements

Hazard pictograms



Signal word Danger

Hazard statements
H226 Flammable liquid and vapour.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H304 May be fatal if swallowed and enters airways.
H411 Toxic to aquatic life with long lasting effects.

Aviation Jet Fuel JET A-1 (JETA1)

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P273 Avoid release to the environment.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor.

P331 Do NOT induce vomiting.

P261 Avoid breathing vapours.

P280 Wear protective gloves.

Contains

Kerosine (petroleum), sweetened, Distillates (petroleum), hydrotreated light; Kerosine - unspecified, Kerosine (petroleum), hydrodesulfurized, Renewable hydrocarbons (kerosine type fraction)

2.3. Other hazards

Other hazards

Evaporates slowly. May cause eye and respiratory system irritation. Risk of soil and ground water contamination.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Kerosine (petroleum), hydrodesulfurized	0 - 100 %
CAS number: 64742-81-0	EC number: 265-184-9
	REACH registration number: 01-2119462828-25-XXXX
Classification	
Flam. Liq. 3 - H226	
Skin Irrit. 2 - H315	
STOT SE 3 - H336	
Asp. Tox. 1 - H304	
Aquatic Chronic 2 - H411	
Distillates (petroleum), hydrotreated light; Kerosine - unspecified	0 - 100 %
CAS number: 64742-47-8	EC number: 265-149-8
	REACH registration number: 01-2119484819-18-XXXX
Classification	
Flam. Liq. 3 - H226	
Skin Irrit. 2 - H315	
STOT SE 3 - H336	
Asp. Tox. 1 - H304	
Aquatic Chronic 2 - H411	

Aviation Jet Fuel JET A-1 (JETA1)

Kerosine (petroleum), sweetened	0 - 100 %
CAS number: 91770-15-9	EC number: 294-799-5
	REACH registration number: 01-2119502385-46-XXXX

Classification

Flam. Liq. 3 - H226
 Skin Irrit. 2 - H315
 STOT SE 3 - H336
 Asp. Tox. 1 - H304
 Aquatic Chronic 2 - H411

Renewable hydrocarbons (kerosine type fraction)	0 - 50 %
CAS number: —	REACH registration number: 01-2119850115-46

Classification

Flam. Liq. 3 - H226
 Asp. Tox. 1 - H304

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Composition comments Mixture of a petroleum product and additives. Total aromatics at maximum: 26,5 %.
 Naphthalene (CAS 91-20-3) < 1 %. Toluene (CAS 108-88-3) < 1%. Benzene (CAS 71-43-2) < 0,1 %.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Remove person to fresh air and keep comfortable for breathing. For breathing difficulties, oxygen may be necessary. If breathing stops, provide artificial respiration. Get medical attention if symptoms are severe or persist.
Ingestion	Do not induce vomiting. Get medical attention immediately.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing.
Eye contact	Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

General information Irritating to skin. May irritate eyes. Vapours in high concentrations are narcotic. May cause nausea, headache, dizziness and intoxication. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Aviation Jet Fuel JET A-1 (JETA1)

5.2. Special hazards arising from the substance or mixture

Specific hazards	Flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up.
Hazardous combustion products	Carbon dioxide (CO ₂). Carbon monoxide (CO).

5.3. Advice for firefighters

Protective actions during firefighting	Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Avoid inhalation of vapours and contact with skin and eyes. Wear adequate protective equipment at all operations.
For emergency responders	Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharge.

6.2. Environmental precautions

Environmental precautions	Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Contain spillage with sand, earth or other suitable non-combustible material. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.
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6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Immediately start clean-up of the liquid and contaminated soil. Small Spillages: Absorb spillage with sand or other inert absorbent. Pay attention to the fire and health hazards caused by the product. Take care as floors and other surfaces may become slippery.
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6.4. Reference to other sections

Reference to other sections	For personal protection, see Section 8.
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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions	The product contains volatile substances which may spread in the atmosphere. Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. Use only non-sparking tools. Ground/bond container and receiving equipment. All handling should only take place in well-ventilated areas. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Wash contaminated clothing before reuse. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).
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7.2. Conditions for safe storage, including any incompatibilities

Aviation Jet Fuel JET A-1 (JETA1)

Storage precautions Flammable liquid storage. Vapours may form explosive mixtures with air. Store in accordance with local regulations. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations. Only store in correctly labelled containers. Use containers made of the following materials: Carbon steel. Stainless steel. Keep container tightly closed. Protect from sunlight.

7.3. Specific end use(s)

Specific end use(s) Not known.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

Solvent naphtha, group 3: 100mg/m³ (8h), HTP 2018/FIN.

The individual limit values can be applied for the hydrocarbons.

Benzene

Benzene: 1 ppm (8h), 3,25 mg/m³, VNa 1267/2019/FIN (binding limit value).

May be absorbed through the skin.

naphthalene

Naphthalene: 1 ppm (8h), 5 mg/m³ (8h), 2 ppm (15min), 10mg/m³ (15min), HTP 2018/FIN.

Naphthalene: 10 ppm (8h), 50 mg/m³ (8h), EU OELV (EC/1991/322).

toluene

Toluene: 25 ppm (8h), 81 mg/m³ (8h), 100ppm (15min), 380 mg/m³ (15min), HTP 2018/FIN.

Toluene: 50 ppm (8h), 192 mg/m³ (8h), 100ppm (15min), 384 mg/m³ (15min), EU OELV (EC/2006/15)

May be absorbed through the skin.

PNEC

Not available.

Renewable hydrocarbons (kerosine type fraction)

DNEL

Workers - Dermal; Long term systemic effects: 42 mg/kg/day

Workers - Inhalation; Long term systemic effects: 147 mg/m³

Category: Kerosines

DNEL

Consumer - Oral; Long term systemic effects: 18,75 mg/kg bw/day

8.2. Exposure controls

Appropriate engineering controls

All handling should only take place in well-ventilated areas. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

Eye/face protection

Tight-fitting safety glasses.

Hand protection

Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber. Neoprene. Polyvinyl chloride (PVC). The selected gloves should have a breakthrough time of at least 8 hours. Protection class 6. Protective gloves according to standards EN 420 and EN 374. Change protective gloves regularly.

Other skin and body protection

Protective clothing when needed. Wear anti-static protective clothing if there is a risk of ignition from static electricity.

Aviation Jet Fuel JET A-1 (JETA1)

Respiratory protection	Filter device/half mask Gas filter, type A2. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140.
Environmental exposure controls	Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Clear.
Odour	Hydrocarbons.
Odour threshold	-
pH	-
Melting point	≤ -47°C (ASTM D2386, D5972, IP 529)
Initial boiling point and range	130 - 300°C (ASTM D 86)
Flash point	≥ 38°C (IP 170)
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 0,6 % Upper flammable/explosive limit: 6 %
Vapour pressure	~ 2 kPa @ 38°C
Vapour density	> 3 (Air = 1.0)
Relative density	0,775 - 0,840 @ 15°C (ASTM D4052)
Solubility(ies)	The product has poor water-solubility. < 50 mg/l @ 20°C
Partition coefficient	log Kow: > 3
Auto-ignition temperature	~ 250°C
Decomposition Temperature	-
Viscosity	Kinematic viscosity < 7 mm ² /s @ 40°C
Explosive properties	Not considered to be explosive.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

Other information	Not known.
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SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	There are no known reactivity hazards associated with this product.
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10.2. Chemical stability

Stability	Stable at normal ambient temperatures and when used as recommended.
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10.3. Possibility of hazardous reactions

Aviation Jet Fuel JET A-1 (JETA1)

Possibility of hazardous reactions No potentially hazardous reactions known.

10.4. Conditions to avoid

Conditions to avoid Keep away from heat, sparks and open flame.

10.5. Incompatible materials

Materials to avoid Oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects Based on available data the classification criteria are not met.

Skin corrosion/irritation

Skin corrosion/irritation Irritating to skin. (EPA Guidelines in FR Vol. 44, No. 145, p. 44054-44093) The product irritates mucous membranes and may cause abdominal discomfort if swallowed. May cause respiratory irritation.

Serious eye damage/irritation

Serious eye damage/irritation Based on available data the classification criteria are not met. (EPA OTS 798.4500)

Skin sensitisation

Skin sensitisation Based on available data the classification criteria are not met. (OECD 406, EPA OTS 798.4100)

Germ cell mutagenicity

Genotoxicity - in vitro Based on available data the classification criteria are not met. (OECD 471, modified Ames test, 479)

Genotoxicity - in vivo Based on available data the classification criteria are not met. (OECD 479)

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met. (OECD 451)

Reproductive toxicity

Reproductive toxicity - fertility Based on available data the classification criteria are not met. (OECD 415)

Reproductive toxicity - development Based on available data the classification criteria are not met. (OECD 414)

Specific target organ toxicity - single exposure

STOT - single exposure May cause nausea, headache, dizziness and intoxication. Anaesthetic in high concentrations.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Based on available data the classification criteria are not met. (OECD 408, 411, 413)

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Toxicological information on ingredients.

Renewable hydrocarbons (kerosine type fraction)

Aviation Jet Fuel JET A-1 (JETA1)

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ > 2000 mg/kg, Oral, Rat (EC B1 tris)

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rat (EC B3)

Category: Kerosines

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ > 5000 mg/kg, Oral, Rat (OECD 420, EPA OTS 798.1175)

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rabbit (OECD 402, EPA OTS 798.1100)

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LC₅₀ > 5,28 mg/l, Inhalation, Rat (4h) (OECD 403)

SECTION 12: Ecological information

12.1. Toxicity

Toxicity Toxic to aquatic life with long lasting effects.

Acute aquatic toxicity

Ecological information on ingredients.

Renewable hydrocarbons (kerosine type fraction)

Acute aquatic toxicity

Acute toxicity - fish LL₅₀, 96 hours: > 1000 mg/l,
WAF (OECD 203)

Acute toxicity - aquatic invertebrates EL₅₀, 48 hours: > 100 mg/l,
WAF (OECD 202)

Acute toxicity - aquatic plants EL₅₀, 72 hours: > 100 mg/l,
WAF (OECD 201)

Acute toxicity - microorganisms EC₅₀, 3 hours: > 1000 mg/l, Micro-organisms (wastewater sludge)
(OECD 209)

Chronic aquatic toxicity

Chronic toxicity - aquatic invertebrates NOEC, 21 days: 1 mg/l,
LOEC, 21 days: 3,2 mg/l, Daphnia magna
WAF (OECD 211)
NOEC, 10 days: 373 mg/kg,
LC₅₀, 10 days: 1200 mg/kg, Sediment organisms
(OSPAR Protocols, Part A: Sediment Bioassay, 2005)

Category: Kerosines

Acute aquatic toxicity

Acute toxicity - fish LL₅₀, 24 hours: 5-17 mg/l, Oncorhynchus mykiss (Rainbow trout)
LL₅₀, 48 hours: 2-5 mg/l, Oncorhynchus mykiss (Rainbow trout)
WAF (OECD 203)

Aviation Jet Fuel JET A-1 (JETA1)

Acute toxicity - aquatic invertebrates	EL50, 24 hours: 4,6 mg/l, Daphnia magna EL50, 48 hours: 1,4 mg/l, Daphnia magna NOEL, 48 hours: 0,3 mg/l, Daphnia magna WAF (OECD 202)
Acute toxicity - aquatic plants	EL50, 24 hours: 1-3 mg/l, Pseudokirchneriella subcapitata NOEL, 24 hours: 1 mg/l, Pseudokirchneriella subcapitata WAF (OECD 201)
<u>Chronic aquatic toxicity</u>	
Chronic toxicity - fish early life stage	NOEL, 28 days: 0,1 mg/l, Oncorhynchus mykiss (Rainbow trout) (QSAR)
Chronic toxicity - aquatic invertebrates	EL50, 21 days: 0.81 mg/l, Daphnia magna NOEL, 21 days: 0,48 mg/l, Daphnia magna WAF (OECD 211)

12.2. Persistence and degradability

Persistence and degradability The product contains volatile substances which may spread in the atmosphere. Can be photodegraded in the atmosphere.

Stability (hydrolysis) No significant reaction in water.

Ecological information on ingredients.

Renewable hydrocarbons (kerosine type fraction)

Biodegradation Rapidly degradable
(OECD 301B)

Category: Kerosines

Biodegradation Inherently biodegradable.
(OECD 301F)

12.3. Bioaccumulative potential

Bioaccumulative potential Possibly bioaccumulative.

Partition coefficient log Kow: > 3

12.4. Mobility in soil

Mobility Evaporates slowly. The product has poor water-solubility. Product can penetrate soil until reaching the surface of ground water. The product contains substances which are bound to particulate matter and are retained in soil.

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects Product causes fouling, and direct contact produces harmful effects e.g. to birds and vegetation. Adsorbed hydrocarbon residues can be harmful to sediment organisms.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Aviation Jet Fuel JET A-1 (JETA1)

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.

SECTION 14: Transport information

Sea transport notes This cargo is considered an Energy-rich fuel and effective 1 January 2019 should be carried subject to Annex I of MARPOL, see Annex 12 of MEPC.2/Circ.24. Please also refer to MEPC.1/Circ.879 - GUIDELINES FOR THE CARRIAGE OF ENERGY-RICH FUELS AND THEIR BLENDS

14.1. UN number

UN No. (ADR/RID) 1863

14.2. UN proper shipping name

Proper shipping name (ADR/RID) UN 1863 FUEL, AVIATION, TURBINE ENGINE

14.3. Transport hazard class(es)

ADR/RID class 3

14.4. Packing group

ADR/RID packing group III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
MARINE POLLUTANT

14.6. Special precautions for user

Hazard Identification Number (ADR/RID) 30

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Commission Regulation (EU) No 2015/830 of 28 May 2015.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

Aviation Jet Fuel JET A-1 (JETA1)

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet	EU OELV = European Occupational Exposure Limit Value
Key literature references and sources for data	Regulations, databases, literature, own research. CONCAWE Report 13/17: Hazard classification and labelling of petroleum substances in the EEA - 2017. Chemical Safety Report Distillates (petroleum), hydrotreated light, 2019. Chemical Safety Report Kerosine (petroleum), hydrodesulfurized, 2019. Chemical Safety Report Kerosine (petroleum), sweetened, 2019. Chemical Safety Report Renewable hydrocarbons (kerosene type fraction): 2011.
Training advice	DO NOT SIPHON PRODUCT BY MOUTH SUCTION.
Revision comments	Updated, sections: 3.2, 8.1, 9.1, 11.1, 12.1-12.2, 14.0, 16. Revised formulation. NOTE: Lines within the margin indicate significant changes from the previous revision.
Revision date	08/06/2020
Supersedes date	17/02/2020
SDS number	5306
Hazard statements in full	H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H336 May cause drowsiness or dizziness. H411 Toxic to aquatic life with long lasting effects.

Exposure scenario

Distribution of Substance - Industrial

Identification

Product name	Kerosines
Version number	2018
Es reference	ES01a

1. Title of exposure scenario

Main title	Distribution of Substance - Industrial
Process scope	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.

Environment

Environmental release category	ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7 Use of functional fluid at industrial site
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SPERC	ESVOC SPERC 1.1b.v1
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Worker

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 Use as laboratory reagent.
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 8,700,000 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 17,000 tonnes
Maximum daily site tonnage: 58 tonnes

Distribution of Substance - Industrial

Frequency and duration of use

Continuous release.
Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (initial release prior to RMM): 1.0E-03
Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil Release fraction to soil from process (initial release prior to RMM): 1.0E-05

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.
Risk from environmental exposure is driven by freshwater sediment.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 95%
Removal efficiency (total): 95%
Maximum allowable site tonnage (M_{safe}), based on release following total wastewater treatment removal: 2.1E+06 kg/day
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 90%.
Water Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0.0 If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.
Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid
Vapour pressure Vapour pressure 0.5 - 10 kPa at STP.
Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Distribution of Substance - Industrial

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures	General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
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Risk management measures

General exposures (closed systems)	No other specific measures identified.
.	.
General exposures (open systems)	No other specific measures identified.
.	.
Process sampling	No other specific measures identified.
.	.
Laboratory activities	No other specific measures identified.
.	.
Bulk transfers	No other specific measures identified.
.	.
Drum and small package filling	No other specific measures identified.
.	.
Equipment cleaning and maintenance	No other specific measures identified.
.	.
Bulk product storage	No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method)
	Maximum Risk Characterisation Ratios for air emissions 2.3E-04 Maximum Risk Characterisation Ratios for wastewater emissions 1.3E-02

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
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Distribution of Substance - Industrial

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Formulation & (Re)packing of Substances and Mixtures - Industrial

Identification

Product name	Kerosines
Version number	2018
Es reference	ES02

1. Title of exposure scenario

Main title	Formulation & (Re)packing of Substances and Mixtures - Industrial
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.

Environment

Environmental release category ERC2 Formulation into mixture

SPERC ESVOC SPERC 2.2.v1

Worker

Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC4 Chemical production where opportunity for exposure arises</p> <p>PROC5 Mixing or blending in batch processes</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</p> <p>PROC14 Tableting, compression, extrusion, pelletisation, granulation</p> <p>PROC15 Use as laboratory reagent.</p>
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
 Regional use tonnage: 6,800,000 tonnes/year
 Fraction of Regional tonnage used locally: 1
 Annual site tonnage: 30,000 tonnes
 Maximum daily site tonnage: 100 tonnes

Frequency and duration of use

Continuous release.
 Emission days: 300 days/year

Formulation & (Re)packing of Substances and Mixtures - Industrial

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): 2.5E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 2.0E-04
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 1.0E-04

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

Good practice	Common practices vary across sites, thus conservative process release estimates used. Risk from environmental exposure is driven by freshwater sediment.
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STP type	Municipal STP.
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STP details	Estimated substance removal from wastewater via domestic sewage treatment: 95.0% Removal efficiency (total): 95.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 100 tonne/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000.
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Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air	Treat air emission to provide a typical removal efficiency of 0%.
Water	Prevent leaks and prevent soil/water pollution caused by leaks. Onsite wastewater treatment required. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 94.8 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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Conditions and measures related to external recovery of waste

Recovery method	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	Vapour pressure 0.5 - 10 kPa at STP.
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
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Formulation & (Re)packing of Substances and Mixtures - Industrial

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Risk management measures

General exposures (closed systems)
No other specific measures identified.

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General exposures (open systems)
No other specific measures identified.

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Process sampling
No other specific measures identified.

.

Laboratory activities
No other specific measures identified.

.

Bulk transfers
No other specific measures identified.

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Mixing operations
No other specific measures identified.

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Manual
Transfer from/pouring from containers
No other specific measures identified.

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Drum/batch transfers
No other specific measures identified.

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Tabletting, compression, extrusion or pelletisation
No other specific measures identified.

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Drum and small package filling
No other specific measures identified.

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Equipment cleaning and maintenance
No other specific measures identified.

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Bulk product storage
No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)
Maximum Risk Characterisation Ratios for air emissions 1.6E-02 Maximum Risk Characterisation Ratios for wastewater emissions 9.7E-01

4. Guidance to check compliance with the exposure scenario (Environment 1)

Formulation & (Re)packing of Substances and Mixtures - Industrial

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use as a Fuel - Industrial

Identification

Product name	Kerosines
Version number	2018
Es reference	ES12a

1. Title of exposure scenario

Main title	Use as a Fuel - Industrial
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Environment

Environmental release category ERC7 Use of functional fluid at industrial site

SPERC ESVOC SPERC 7.12a.v1

Worker

Process category

PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions
 PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions
 PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition
 PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities
 PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities
 PROC16 Use of fuels

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
 Regional use tonnage: 1,600,000 tonnes/year
 Fraction of Regional tonnage used locally: 1
 Annual site tonnage: 1,500,000 tonnes
 Maximum daily site tonnage: 5000 tonnes

Frequency and duration of use

Continuous release.
 Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 5.0E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures

Use as a Fuel - Industrial

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.
Risk from environmental exposure is driven by freshwater sediment.

STP type Municipal STP.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 95.0%
Removal efficiency (total): 95%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.1E+06 tonne/day
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 95%.

Water Prevent leaks and prevent soil/water pollution caused by leaks. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 94.4 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0

Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Recovery method This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Vapour pressure Vapour pressure 0.5 - 10 kPa at STP.

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Assumes a good basic standard of occupational hygiene is implemented.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Use as a Fuel - Industrial

Risk management measures

General exposures (closed systems)
No other specific measures identified.

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Use as a fuel
(closed systems)
No other specific measures identified.

.
Bulk transfers
No other specific measures identified.

.
Drum/batch transfers
No other specific measures identified.

.
Equipment cleaning and maintenance
No other specific measures identified.

.
Bulk product storage
No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method)
	Maximum Risk Characterisation Ratios for air emissions 2.9E-02 Maximum Risk Characterisation Ratios for wastewater emissions 9.0E-01

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use as a Fuel - Professional

Identification

Product name	Kerosines
Version number	2018
Es reference	ES12b

1. Title of exposure scenario

Main title	Use as a Fuel - Professional
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.

Environment

Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
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SPERC	ESVOC SPERC 9.12b.v1
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Worker

Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC16 Use of fuels
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2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Amounts used

Fraction of EU tonnage used in region: 0.1
Regional use tonnage: 4,600,000 tonnes/year
Fraction of Regional tonnage used locally: 1
Annual site tonnage: 2300 tonnes
Maximum daily site tonnage: 6.4 tonnes

Frequency and duration of use

Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from wide dispersive use (regional only): 1.0E-03
Emission factor - water	Release fraction to wastewater from wide dispersive use: 1.0E-05
Emission factor - soil	Release fraction to soil from wide dispersive use (regional only): 1.0E-05

Environmental factors not influenced by risk management measures

Use as a Fuel - Professional

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.
Risk from environmental exposure is driven by fresh water.

STP type Municipal STP.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 95.0%
Removal efficiency (total): 95.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.9E+05 kg/day
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of N/A%.

Water Prevent leaks and prevent soil/water pollution caused by leaks. Onsite wastewater treatment required. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0.0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0

Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.

Conditions and measures related to external recovery of waste

Recovery method This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Vapour pressure Vapour pressure 0.5 - 10 kPa at STP.

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Assumes a good basic standard of occupational hygiene is implemented.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/limit releases, dispersion and exposure

Organisational measures General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Use as a Fuel - Professional

Risk management measures

General exposures (closed systems)
No other specific measures identified.

.
Use as a fuel
(closed systems)
No other specific measures identified.

.
Bulk transfers
No other specific measures identified.

.
Transfer from/pouring from containers
No other specific measures identified.

.
Equipment cleaning and maintenance
No other specific measures identified.

.
Bulk product storage
No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method)
	Maximum Risk Characterisation Ratios for air emissions 4.4E-04 Maximum Risk Characterisation Ratios for wastewater emissions 3.4E-03

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-for-industries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.



SAFETY DATA SHEET

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name	Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel
Chemical name	Renewable hydrocarbons (diesel type fraction)
Product number	ID 13898
REACH registration number	01-2119450077-42-0000
REACH registration notes	01-2119450077-42-0000 / -0001 / -0002

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Formulation & (re)packing of substances and mixtures (ES 02) Distribution of substance (ES 04) Use as an intermediate (ES 05) Use as a fuel (ES 06, 14, 23)
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1.3. Details of the supplier of the safety data sheet

Supplier	Neste Oyj Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND Tel. +358 10 45811 SDS@neste.com (chemical safety)
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1.4. Emergency telephone number

National emergency telephone number	+358-9-471 977, +358-9-4711, Poison Information Centre
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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (EC 1272/2008)

Physical hazards	Not Classified
Health hazards	Asp. Tox. 1 - H304
Environmental hazards	Not Classified

2.2. Label elements

Hazard pictograms



Signal word	Danger
Hazard statements	H304 May be fatal if swallowed and enters airways.
Precautionary statements	P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. P331 Do NOT induce vomiting. P501 Dispose of contents/ container in accordance with national regulations.

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

Supplemental label information EUH066 Repeated exposure may cause skin dryness or cracking.

Contains Renewable hydrocarbons (diesel type fraction)

2.3. Other hazards

Other hazards Combustible liquid. Risk of soil and ground water contamination.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Renewable hydrocarbons (diesel type fraction)	ca. 100%
CAS number: —	REACH registration number: 01-2119450077-42-XXXX
Classification	
Asp. Tox. 1 - H304	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Other information Mixture of renewable raw material fuel and additives., Contains middle distillate-range iso- and n-paraffinic hydrocarbons., Total aromatics at maximum 1,0 Weight %., Renewable hydrocarbons (diesel type fraction);, REACH Nr: 01-2119450077-42-0000 / -0001 / -0002., Identity outside the EU (CAS number and name of the substance);, Alkanes, C10-20-branched and linear, CAS 928771-01-1.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Unlikely to be hazardous by inhalation because of the low vapour pressure of the product at ambient temperature. If spray/mist has been inhaled, proceed as follows. Remove person to fresh air and keep comfortable for breathing. Get medical attention if symptoms are severe or persist.
Ingestion	Do not induce vomiting. Get medical attention immediately.
Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing.
Eye contact	Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

General information Repeated exposure may cause skin dryness or cracking. Spray/mists may cause respiratory tract irritation. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor Treat symptomatically.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

Specific hazards	Combustible liquid. Containers can burst violently or explode when heated, due to excessive pressure build-up.
Hazardous combustion products	Carbon dioxide (CO ₂). Carbon monoxide (CO).
5.3. Advice for firefighters	
Protective actions during firefighting	Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Wear adequate protective equipment at all operations.
For emergency responders	Prevent unauthorized access. Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharge.

6.2. Environmental precautions

Environmental precautions	Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.
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6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Immediately start clean-up of the liquid and contaminated soil. Contain spillage with sand, earth or other suitable non-combustible material. Pay attention to the fire and health hazards caused by the product.
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6.4. Reference to other sections

Reference to other sections	For personal protection, see Section 8.
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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions	Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. All handling should only take place in well-ventilated areas. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).
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7.2. Conditions for safe storage, including any incompatibilities

Storage precautions	Flammable liquid storage. Store in accordance with local regulations. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations. Only store in correctly labelled containers. Use containers made of the following materials: Carbon steel. Stainless steel.
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7.3. Specific end use(s)

Specific end use(s)	Not known.
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SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

Ingredient comments The individual limit values can be applied for the hydrocarbons. Diesel fuel as total hydrocarbons; ACGIH TLV®-TWA (8h) 100 mg/m³ (IFV).

PNEC Not available.

Renewable hydrocarbons (diesel type fraction)

DNEL Workers - Inhalation; Long term systemic effects: 147 mg/m³
 Workers - Dermal; Long term systemic effects: 42 mg/kg/day
 Consumer - Inhalation; Long term systemic effects: 94 mg/m³
 Consumer - Dermal; Long term systemic effects: 18 mg/kg/day

8.2. Exposure controls

Appropriate engineering controls All handling should only take place in well-ventilated areas. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

Eye/face protection Tight-fitting safety glasses.

Hand protection Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber. Neoprene. Polyvinyl chloride (PVC). The selected gloves should have a breakthrough time of at least 4 hours. Protection class 5. Protective gloves according to standards EN 420 and EN 374. Change protective gloves regularly.

Other skin and body protection Wear suitable protective clothing as protection against splashing or contamination. Wear anti-static protective clothing if there is a risk of ignition from static electricity.

Respiratory protection Filter device/half mask Combination filter, type A2/P2. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140.

Environmental exposure controls Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Liquid.
Colour	Clear.
Odour	Mild.
Odour threshold	-
pH	-
Melting point	Pour point < -20°C @ 1013 hPa (BS4633, EC A1)
Initial boiling point and range	180-320°C (EN ISO 3405)
Flash point	> 61°C (EN ISO 2719, EC A9)
Upper/lower flammability or explosive limits	-
Vapour pressure	0,087 kPa @ 25°C (EC A4)
Vapour density	-

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

Relative density	0,77 - 0,79 @ 15/4°C (EN ISO 12185, EC A3)
Solubility(ies)	Insoluble in water. ~ 0,075 mg/l water @ 25°C (calculated) Soluble in the following materials: Methanol. Hydrocarbons.
Partition coefficient	log Kow: > 6,5 (EC A8)
Auto-ignition temperature	204°C (EC A15)
Decomposition Temperature	-
Viscosity	Kinematic viscosity 4.0 mm ² /s @ 20°C 2.6 mm ² /s @ 40°C (OECD 114) Dynamic viscosity ≤ 5 mPa s @ 20°C
Explosive properties	Not considered to be explosive. (EC A14)
Oxidising properties	Does not meet the criteria for classification as oxidising.
9.2. Other information	
Other information	Not known.

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability Stable at normal ambient temperatures and when used as recommended.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No potentially hazardous reactions known.

10.4. Conditions to avoid

Conditions to avoid Keep away from heat, sparks and open flame.

10.5. Incompatible materials

Materials to avoid Oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products Does not decompose when used and stored as recommended.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects Based on available data the classification criteria are not met.

Skin corrosion/irritation

Skin corrosion/irritation Based on available data the classification criteria are not met. (EC B4) Repeated exposure may cause skin dryness or cracking. The product irritates mucous membranes and may cause abdominal discomfort if swallowed. May cause respiratory system irritation.

Serious eye damage/irritation

Serious eye damage/irritation Based on available data the classification criteria are not met. (EC B5)

Skin sensitisation

Skin sensitisation Based on available data the classification criteria are not met. (EC B6)

Germ cell mutagenicity

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

Genotoxicity - in vitro Based on available data the classification criteria are not met. (EC B10, B13/14 & B17).

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met.

Reproductive toxicity

Reproductive toxicity - fertility Based on available data the classification criteria are not met. (OECD 416)

Specific target organ toxicity - single exposure

STOT - single exposure Not classified as a specific target organ toxicant after a single exposure.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Based on available data the classification criteria are not met. (OECD 408)

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Toxicological information on ingredients.

Renewable hydrocarbons (diesel type fraction)

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ >2000 mg/kg, Oral, Rat (EC B1 tris)

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ > 2000 mg/kg, Dermal, Rat (EC B3)

SECTION 12: Ecological information

12.1. Toxicity

Toxicity Based on available data the classification criteria are not met.

Ecological information on ingredients.

Renewable hydrocarbons (diesel type fraction)

Acute aquatic toxicity

Acute toxicity - fish LL₅₀, 96 hours: > 1000 mg/l,
WAF (OECD 203)

Acute toxicity - aquatic invertebrates EL50, 48 hours: > 100 mg/l,
WAF (OECD 202)

Acute toxicity - aquatic plants EL50, 72 hours: > 100 mg/l, Algae
WAF (OECD 201)

Acute toxicity - microorganisms EC₅₀, 30-180 minutes: > 1000 mg/l, Micro-organisms (wastewater sludge)
(OECD 209)

Chronic aquatic toxicity

Chronic toxicity - aquatic invertebrates NOEC, 21 days: 1 mg/l,
LOEC, 21 days: 3,2 mg/l,
WAF (OECD 211)
Sediment organisms
NOEC, 10 days: 373 mg/kg,
LOEC, 10 days: 1165 mg/kg,
LC₅₀, 10 days: 1200 mg/kg,
(OSPAR Protocols, Part A: Sediment Bioassay, 2005)

Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

12.2. Persistence and degradability

Stability (hydrolysis)	No significant reaction in water.
Biodegradation	Rapidly degradable (OECD 301B).

Ecological information on ingredients.

Renewable hydrocarbons (diesel type fraction)

Biodegradation	Rapidly degradable (OECD 301B)
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12.3. Bioaccumulative potential

Bioaccumulative potential	Possibly bioaccumulative.
Partition coefficient	log Kow: > 6,5 (EC A8)

12.4. Mobility in soil

Mobility	Evaporates slowly. The product has poor water-solubility. The product contains substances which are bound to particulate matter and are retained in soil. Log Koc > 5.6 (EC C19).
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12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This product does not contain any substances classified as PBT or vPvB.
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12.6. Other adverse effects

Other adverse effects	Not known.
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SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Product residues retained in emptied containers can be hazardous. Waste packaging should be collected for reuse or recycling.
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SECTION 14: Transport information

Sea transport notes	This cargo is considered an Energy-rich fuel and effective 1 January 2019 should be carried subject to Annex I of MARPOL, see Annex 12 of MEPC.2/Circ.24. Please also refer to MEPC.1/Circ.879 - GUIDELINES FOR THE CARRIAGE OF ENERGY-RICH FUELS AND THEIR BLENDS
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14.1. UN number

UN No. (ADR/RID)	1202
UN No. (IMDG)	Not classified under IMDG.

14.2. UN proper shipping name

Proper shipping name (ADR/RID)	UN 1202 DIESEL FUEL
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14.3. Transport hazard class(es)

ADR/RID class	3
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Neste Renewable Diesel; Neste Renewable Diesel 100 %; Neste MY Renewable Diesel

ADN subsidiary risk F (floater)

14.4. Packing group

ADR/RID packing group III

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant

No.

14.6. Special precautions for user

Hazard Identification Number 30
(ADR/RID)

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

EU legislation Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended).
Commission Regulation (EU) No 2015/830 of 28 May 2015.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet DNEL = Derived No-Effect Level
PNEC = Predicted No-Effect Concentration
WAF = Water Accommodated Fraction

Key literature references and sources for data Regulations, databases, literature, own research. Chemical Safety Report Renewable hydrocarbons (diesel type fraction), 2017.

Revision comments Updated, sections: 1.3. NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date 01/10/2019

Supersedes date 29/08/2019

SDS number 5359

Hazard statements in full H304 May be fatal if swallowed and enters airways.

Exposure scenario

Distribution of Substance - Industrial

Identification

Product name	Renewable hydrocarbons (diesel type fraction)
REACH registration number	01-2119450077-42-XXXX
Version number	2017
Es reference	04

1. Title of exposure scenario

Main title	Distribution of Substance - Industrial
Process scope	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.
Main sector	SU3 Industrial uses
Environment	
Environmental release category	ERC7 Use of functional fluid at industrial site
SPERC	ESVOC SPERC 1.1b.v1
Worker	
Process category	<p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</p> <p>PROC15 Use as laboratory reagent.</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 1
Daily amount per site: ≤ 5000 t
Annual amount per site: ≤ 1 500 000 t

Frequency and duration of use

Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	0,001%
Emission factor - water	4E-7%.
Emission factor - soil	0,001%

Environmental factors not influenced by risk management measures

Distribution of Substance - Industrial

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP type Aerobic biological treatment

STP details Assumed domestic sewage treatment plant flow (m³/day):
2000.

Conditions and measures related to external treatment of waste for disposal

Waste treatment Dispose of waste in accordance with environmental legislation.

Conditions and measures related to external recovery of waste

Recovery method All waste product is assumed to be collected and returned for re-processing or use as a fuel.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

Potentially exposed body parts PROC 3, PROC 15: Covers skin contact area up to 240 cm². Palm of one hand. PROC 2, PROC 9: Covers skin contact area up to 480 cm². Palm of both hands. PROC 8a, 8b: Covers skin contact area up to 960 cm². Both hands.

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature ≤ 40°C

Ventilation rate 1 -3 air changes per hour Unless otherwise stated.

Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Distribution of Substance - Industrial

General exposures (closed systems)
With occasional controlled exposure
(PROC 3)
No specific measures identified.

Process sampling
(PROC 3)
Wear suitable gloves tested to EN374.

Laboratory activities
(PROC 15)
Provide adequate general and local exhaust ventilation.
Wear suitable gloves tested to EN374.
Recommendation:
Handle in a fume cupboard or under extract ventilation.

Bulk transfers
Road tanker/rail car loading.
(closed systems)
(PROC 8b)
Recommendation:
Use vapour recovery units when necessary.
Wear suitable gloves tested to EN374.

Bulk transfers
Marine vessel/barge (un)loading.
(closed systems)
(PROC 8b)
Recommendation:
Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance
(PROC 8a)
Provide adequate general and local exhaust ventilation.
Recommendation:
Drain down and flush system prior to equipment break-in or maintenance.
Wear suitable gloves tested to EN374.

Storage
With occasional controlled exposure
(PROC 2)
No specific measures identified.

Drum and small package filling
(PROC 9)
Recommendation:
Wear suitable gloves tested to EN374.

Distribution of Substance - Industrial

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model.

3. Exposure estimation (Health 1)

Assessment method Used CHESAR model.

Exposure scenario

Formulation & (re)packing - Industrial

Identification

Product name	Renewable hydrocarbons (diesel type fraction)
REACH registration number	01-2119450077-42-XXXX
Version number	2017
Es reference	02

1. Title of exposure scenario

Main title	Formulation & (re)packing - Industrial
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Main sector	SU3 Industrial uses
Environment	
Environmental release category	ERC2 Formulation into mixture
SPERC	ESVOC SPERC 2.2.v1
Worker	
Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC5 Mixing or blending in batch processes</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</p> <p>PROC15 Use as laboratory reagent.</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 1
Daily amount per site: ≤ 100 t
Annual amount per site: ≤ 1 500 000 t

Frequency and duration of use

Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	0,25%
Emission factor - water	0,005%

Formulation & (re)packing - Industrial

Emission factor - soil 0.01%

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP type Aerobic biological treatment

STP details Assumed domestic sewage treatment plant flow (m³/day):
2000.

Conditions and measures related to external treatment of waste for disposal

Disposal method Dispose of waste in accordance with environmental legislation.

Conditions and measures related to external recovery of waste

Recovery method All waste product is assumed to be collected and returned for re-processing or use as a fuel.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

Potentially exposed body parts PROC 1, PROC 3, PROC 15: Covers skin contact area up to 240 cm². Palm of one hand.
PROC 2, PROC 5, PROC 9: Covers skin contact area up to 480 cm². Palm of both hands.
PROC 8a, 8b: Covers skin contact area up to 960 cm². Both hands.

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature ≤ 40 °C

Ventilation rate 1 - 3 air changes per hour Unless otherwise stated.

Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Formulation & (re)packing - Industrial

Mixing operations
(PROC 3)
No specific measures identified.

Batch processes at elevated temperatures
(PROC 3)
No specific measures identified.

Process sampling
(PROC 3)
Wear suitable gloves tested to EN374.

Laboratory activities
(PROC 15)
Provide adequate general and local exhaust ventilation.
Wear suitable gloves tested to EN374.
Recommendation:
Handle in a fume cupboard or under extract ventilation.

Bulk transfers
(PROC 8b)
No specific measures identified.

Mixing operations
(open systems)
With potential for aerosol generation
(PROC 5)
Recommendation:
Wear suitable gloves tested to EN374.

Transfer from/pouring from containers
Manual
(PROC 8a)
Wear suitable gloves tested to EN374.

Drum/batch transfers
(PROC 8b)
No specific measures identified.

Drum and small package filling
(PROC 9)
Provide adequate general and local exhaust ventilation.
Recommendation:
Fill containers/cans at dedicated fill points supplied with local extract ventilation.

Equipment cleaning and maintenance

Formulation & (re)packing - Industrial

(PROC 8a)

Provide adequate general and local exhaust ventilation.

Recommendation:

Drain down and flush system prior to equipment break-in or maintenance.

Wear suitable gloves tested to EN374.

Storage

(PROC 1, PROC 2)

No specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model.

3. Exposure estimation (Health 1)

Assessment method Used CHESAR model.

Exposure scenario

Use as a fuel - Industrial

Identification

Product name	Renewable hydrocarbons (diesel type fraction)
REACH registration number	01-2119450077-42-XXXX
Version number	2017
Es reference	06

1. Title of exposure scenario

Main title	Use as a fuel - Industrial
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Main sector	SU3 Industrial uses
Environment	
Environmental release category	ERC7 Use of functional fluid at industrial site
SPERC	ESVOC SPERC 7.12a.v1
Worker	
Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC4 Chemical production where opportunity for exposure arises</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC15 Use as laboratory reagent.</p> <p>PROC16 Use of fuels</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 1
Daily amount per site: ≤ 5000 t
Annual amount per site: ≤ 10 000 t

Frequency and duration of use

Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	0.025%
Emission factor - water	0,001%
Emission factor - soil	0%

Environmental factors not influenced by risk management measures

Use as a fuel - Industrial

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP type Aerobic biological treatment

STP details Assumed domestic sewage treatment plant flow (m³/day):
2000.

Conditions and measures related to external treatment of waste for disposal

Disposal method Dispose of waste in accordance with environmental legislation.

Conditions and measures related to external recovery of waste

Recovery method Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

Potentially exposed body parts PROC 1, PROC 3, PROC 15, PROC 16: Covers skin contact area up to 240 cm². Palm of one hand. PROC 2, PROC 4: Covers skin contact area up to 480 cm². Palm of both hands. PROC 8a, 8b: Covers skin contact area up to 960 cm². Both hands.

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature ≤ 40 °C

Ventilation rate 1 - 3 air changes per hour Unless otherwise stated.

Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Use as a fuel - Industrial

Bulk transfers
(PROC 4)
Recommendation:
Wear suitable gloves tested to EN374.

Drum/batch transfers
(PROC 8b)
Provide adequate general and local exhaust ventilation.
Recommendation:
Use drum pumps or carefully pour from container.
Wear suitable gloves tested to EN374.

Bulk transfers
(PROC 8b)
Recommendation:
Use drum pumps or carefully pour from container.
Wear suitable gloves tested to EN374.

General exposures (closed systems)
Continuous process
(PROC 1)
No specific measures identified.

General exposures (closed systems)
Continuous process
With sample collection
(PROC 2)
Recommendation:
Ensure material transfers are under containment or extract ventilation.

General exposures (closed systems)
Batch process
(PROC 3)
Recommendation:
Ensure material transfers are under containment or extract ventilation.

General exposures (open systems)
(PROC 16)
Recommendation:
Ensure material transfers are under containment or extract ventilation.

Process sampling
(PROC 3)
Recommendation:
Wear suitable gloves tested to EN374.

Equipment cleaning and maintenance

Use as a fuel - Industrial

(PROC 8a)

Provide adequate general and local exhaust ventilation.

Recommendation:

Drain down and flush system prior to equipment break-in or maintenance.

Wear suitable gloves tested to EN374.

Vessel and container cleaning

(PROC 8a)

Provide adequate general and local exhaust ventilation.

Recommendation:

Drain down and flush system prior to equipment break-in or maintenance.

Provide enhanced general ventilation by mechanical means.

If above technical/organisational control measures are not feasible, then adopt following PPE:

Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

Wear suitable gloves tested to EN374.

Wear suitable coveralls to prevent exposure to the skin.

Storage

(PROC 1, PROC 2)

No specific measures identified.

Refuelling

(PROC 8b)

Recommendation:

Use drum pumps or carefully pour from container.

Use vapour recovery units when necessary.

Wear suitable gloves tested to EN374.

Laboratory activities

(PROC 15)

Recommendation:

Handle in a fume cupboard or under extract ventilation.

Wear suitable gloves (tested to EN374), coverall and eye protection.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model.

3. Exposure estimation (Health 1)

Assessment method Used CHESAR model.

Exposure scenario

Use as a fuel - Professional

Identification

Product name	Renewable hydrocarbons (diesel type fraction)
REACH registration number	01-2119450077-42-XXXX
Version number	2017
Es reference	14

1. Title of exposure scenario

Main title	Use as a fuel - Professional
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Main sector	SU22 Professional uses
Environment	
Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
SPERC	ESVOC SPERC 9.12b.v1
Worker	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC16 Use of fuels

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 0.1
Daily amount per site: ≤ 160 kg

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	0,01 %
Emission factor - water	0,001 %
Emission factor - soil	0,001 %

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Use as a fuel - Professional

Risk management measures

STP type	Aerobic biological treatment
STP details	Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Conditions and measures related to external treatment of waste for disposal

Disposal method	Dispose of waste in accordance with environmental legislation.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

Potentially exposed body parts	PROC 1, PROC 3, PROC 16: Covers skin contact area up to 240 cm ² . Palm of one hand. PROC 2: Covers skin contact area up to 480 cm ² . Palm of both hands. PROC 8a, 8b: Covers skin contact area up to 960 cm ² . Both hands.
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Other given operational conditions affecting workers exposure

Setting	Indoor use.
Temperature	≤ 40 °C
Ventilation rate	1 - 3 air changes per hour Unless otherwise stated.

Risk management measures

Use as a fuel - Professional

Bulk transfers

Heating oil and diesel deliveries

(PROC 8b)

Provide adequate general and local exhaust ventilation.

Recommendation:

Handle substance within a closed system.

Wear suitable gloves tested to EN374.

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Drum/batch transfers

(PROC 8b)

Provide adequate general and local exhaust ventilation.

Recommendation:

Use drum pumps or carefully pour from container.

Wear suitable gloves tested to EN374.

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Refuelling

(PROC 8b)

Provide adequate general and local exhaust ventilation.

Recommendation:

Use drum pumps or carefully pour from container.

Wear suitable gloves tested to EN374.

.

Dipping, immersion and pouring

(PROC 8b)

Wear suitable gloves tested to EN374.

.

General exposures

(PROC 1, PROC 2, PROC 3, PROC 16)

No specific measures identified.

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Equipment cleaning and maintenance

(PROC 8a)

Provide adequate general and local exhaust ventilation.

Recommendation:

Drain down and flush system prior to equipment break-in or maintenance.

Wear suitable gloves tested to EN374.

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Vessel and container cleaning

(PROC 8a)

Provide adequate general and local exhaust ventilation.

Recommendation:

Drain down and flush system prior to equipment break-in or maintenance.

Wear suitable gloves tested to EN374.

.

Storage

(PROC 1, PROC 2)

No specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model.

3. Exposure estimation (Health 1)

Assessment method Used CHESAR model.

Exposure scenario

Use as a fuel - Consumer

Identification

Product name	Renewable hydrocarbons (diesel type fraction)
REACH registration number	01-2119450077-42-XXXX
Version number	2017
Es reference	23

1. Title of exposure scenario

Main title	Use as a fuel - Consumer
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Product category	PC13 Fuels.
Main sector	SU21 Consumer uses
Environment	
Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
SPERC	ESVOC SPERC 9.12c.v1
Non-industrial	
Product sub-category	PC13_1 Liquid: automotive refuelling PC13_2 Liquid: scooter refuelling PC13_3 Liquid: garden equipment - use PC13_4 Liquid: Garden equipment - Refuelling PC13_5 Liquid: lamp oil PC13_6 Liquid: home space heater fuel PC13_n Liquid: refuelling of boats

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 0,1
Daily amount per site: ≤ 550 kg

Frequency and duration of use

Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	0,01 %
Emission factor - water	0,001 %
Emission factor - soil	0,001 %

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

Use as a fuel - Consumer

Technical measures	Indoor/outdoor use.
STP type	Aerobic biological treatment
STP details	Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Conditions and measures related to external treatment of waste for disposal

Disposal method	Dispose of waste in accordance with environmental legislation.
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2. Conditions of use affecting exposure (Non-industrial - Health 1)

Product characteristics

Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).
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Amounts used

PC13_1 Liquid: automotive refuelling
For each use event, covers use amounts up to 38,6 kg.
PC13_2 Liquid: scooter refuelling
For each use event, covers use amounts up to 7,5 kg.
PC13_3 Liquid: garden equipment - use
For each use event, covers use amounts up to 772 g.
PC13_4 Liquid: Garden equipment - Refuelling
For each use event, covers use amounts up to 772 g.
PC13_5 Liquid: lamp oil
For each use event, covers use amounts up to 100 g.
PC13_6 Liquid: home space heater fuel
For each use event, covers use amounts up to 3320 g.
PC13_n Liquid: refuelling of boats
For each use event, covers use amounts up to 156,0 kg.

Frequency and duration of use

Use as a fuel - Consumer

Covers use up to 1 time(s)/day.

.
PC13_1 Liquid: automotive refuelling
Covers exposure up to 0,05 hours per event.
(occasional use over a year)

.
PC13_2 Liquid: scooter refuelling
Covers exposure up to 0,02 hours per event.
(frequent use over a year)

.
PC13_3 Liquid: garden equipment - use
Covers exposure up to 2,00 hours per event.
(occasional use over a year)

.
PC13_4 Liquid: Garden equipment - Refuelling
Covers exposure up to 0,03 hours per event.
(occasional use over a year)

.
PC13_5 Liquid: lamp oil
Covers exposure up to 0,01 hours per event.
(occasional use over a year)

.
PC13_6 Liquid: home space heater fuel
Covers exposure up to 0,1 hours per event.
(frequent use over a year)

.
PC13_n Liquid: refuelling of boats
Covers exposure up to 0,25 hours per event.
(infrequent use over a year)

Human factors not influenced by risk management

Potentially exposed body parts Palm of one hand. Unless otherwise stated. PC13_4 Liquid: Garden equipment - Refuelling :
Palm of both hands.

Other given operational conditions affecting Non-industrial exposure

Setting Outdoor use. Unless otherwise stated. PC13_5 Liquid: lamp oil : Indoor/outdoor use.

Other given operational conditions affecting Non-industrial exposure

Avoid contact with skin, eyes and clothing. Wash promptly if skin becomes contaminated. All handling should only take place in well-ventilated areas. Do not ingest. If swallowed, then seek immediate medical assistance.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model.

3. Exposure estimation (Health 1)

Assessment method Used CHESAR model.

Exposure scenario

Use as Intermediate - Industrial

Identification

Product name	Renewable hydrocarbons (diesel type fraction)
REACH registration number	01-2119450077-42-XXXX
Version number	2017
Es reference	05

1. Title of exposure scenario

Main title	Use as Intermediate - Industrial
Process scope	Use of substance as an intermediate (not related to Strictly Controlled Conditions). Includes recycling/recovery, material transfers, storage, sampling, associated laboratory activities, maintenance and loading (including marine vessel/barge, road/rail car and bulk container).
Main sector	SU3 Industrial uses
Environment	
Environmental release category	ERC6a Use of intermediate
SPERC	ESVOC SPERC 6.1a.v1
Worker	
Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC4 Chemical production where opportunity for exposure arises</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC15 Use as laboratory reagent.</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)

Amounts used

Fraction of EU tonnage used in region: 1
 Daily amount per site: ≤ 50 t
 Annual amount per site: ≤ 15 000 t

Frequency and duration of use

Emission days: 300 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	0,002%
Emission factor - water	0,001%
Emission factor - soil	0.1%

Environmental factors not influenced by risk management measures

Use as Intermediate - Industrial

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

STP type Aerobic biological treatment

STP details Assumed domestic sewage treatment plant flow (m³/day):
2000.

Conditions and measures related to external treatment of waste for disposal

Disposal method Dispose of waste in accordance with environmental legislation.

Conditions and measures related to external recovery of waste

Recovery method Retain drain-downs in sealed storage pending disposal or for subsequent recycle.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Human factors not influenced by risk management

Potentially exposed body parts PROC 1, PROC 3, PROC 15: Covers skin contact area up to 240 cm². Palm of one hand.
PROC 2, PROC 4: Covers skin contact area up to 480 cm². Palm of both hands. PROC 8a,
8b: Covers skin contact area up to 960 cm². Both hands.

Other given operational conditions affecting workers exposure

Setting Indoor use.

Temperature ≤ 40 °C

Ventilation rate 1 - 3 air changes per hour Unless otherwise stated.

Assumes a good basic standard of occupational hygiene is implemented.

Risk management measures

Use as Intermediate - Industrial

General exposures (closed systems)
(PROC 1)
No specific measures identified.

General exposures (closed systems)
With sample collection
With occasional controlled exposure
(PROC 2)
No specific measures identified.

General exposures (closed systems)
Batch process
(PROC 3)
No specific measures identified.

General exposures (open systems)
Batch process
With sample collection
(PROC 4)
No specific measures identified.

Sampling
(PROC 8b)
No specific measures identified.

Laboratory activities
(PROC 15)
Provide adequate general and local exhaust ventilation.
Wear suitable gloves tested to EN374.
Recommendation:
Handle in a fume cupboard or under extract ventilation.

Bulk transfers
(closed systems)
(PROC 8b)
No specific measures identified.

Equipment cleaning and maintenance
(PROC 8a)
Provide adequate general and local exhaust ventilation.
Recommendation:
Drain down and flush system prior to equipment break-in or maintenance.
Wear suitable gloves tested to EN374.

Storage
(PROC 1, PROC 2)
No specific measures identified.

Use as Intermediate - Industrial

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model.

3. Exposure estimation (Health 1)

Assessment method Used CHESAR model.



SAFETY DATA SHEET

Neste Renewable Naphtha

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name	Neste Renewable Naphtha
Chemical name	Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich
Product number	ID 14689
Internal identification	BEBIO1, NExBE-1
EU REACH registration number	01-2119497828-14-0000

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Manufacture of substance Distribution of substance Formulation & (re)packing of substances and mixtures Use as a fuel Use in laboratories
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1.3. Details of the supplier of the safety data sheet

Supplier	Neste Oyj Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND Tel. +358 10 45811 SDS@neste.com (chemical safety)
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1.4. Emergency telephone number

National emergency telephone number	+358 800 147 111, +358 9 471 977, Poison Information Centre
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SECTION 2: Hazards identification

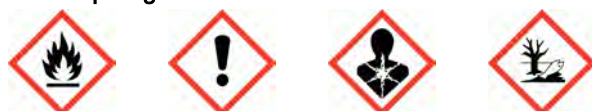
2.1. Classification of the substance or mixture

Classification (SI 2019 No. 720)

Physical hazards	Flam. Liq. 2 - H225
Health hazards	Skin Irrit. 2 - H315 Repr. 2 - H361f STOT SE 3 - H336 STOT RE 2 - H373 Asp. Tox. 1 - H304
Environmental hazards	Aquatic Chronic 2 - H411

2.2. Label elements

Hazard pictograms



Signal word

Danger

Neste Renewable Naphtha

Hazard statements	H225 Highly flammable liquid and vapour. H315 Causes skin irritation. H361f Suspected of damaging fertility. H336 May cause drowsiness or dizziness. H373 May cause damage to organs through prolonged or repeated exposure. H304 May be fatal if swallowed and enters airways. H411 Toxic to aquatic life with long lasting effects.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P271 Use only outdoors or in a well-ventilated area. P273 Avoid release to the environment. P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. P331 Do NOT induce vomiting. P370+P378 In case of fire: Use foam, carbon dioxide or dry powder to extinguish.
Contains	Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich
2.3. Other hazards	
Other hazards	Volatile. Vapours may form explosive mixtures with air. Risk of soil and ground water contamination.

SECTION 3: Composition/information on ingredients

3.1. Substances

Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich	100 %
CAS number: —	
Classification	
Flam. Liq. 2 - H225	
Skin Irrit. 2 - H315	
Repr. 2 - H361f	
STOT SE 3 - H336	
STOT RE 2 - H373	
Asp. Tox. 1 - H304	
Aquatic Chronic 2 - H411	

The Full Text for all R-Phrases and Hazard Statements are Displayed in Section 16.

Product name	Neste Renewable Naphtha
Chemical name	Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich
EU REACH registration number	01-2119497828-14-0000
Ingredient notes	Identity outside the EU (CAS number and name of the substance): Alkanes, C4-10-branched and linear; CAS 90622-50-7.
Composition comments	Benzene (CAS 71-43-2) and toluene (CAS 108-88-3) < 0,1 %, n-hexane (CAS 110-54-3) > 5 %.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Remove person to fresh air and keep comfortable for breathing. For breathing difficulties, oxygen may be necessary. Get medical attention if symptoms are severe or persist.
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Neste Renewable Naphtha

Ingestion	Do not induce vomiting. Get medical attention immediately.
Skin contact	Rinse immediately contaminated clothing and skin with plenty of water before removing clothes. Wash skin thoroughly with soap and water. Get medical attention if irritation persists after washing.
Eye contact	Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2. Most important symptoms and effects, both acute and delayed

General information	Irritating to skin. May irritate eyes. Vapours in high concentrations are narcotic. May cause nausea, headache, dizziness and intoxication. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.
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4.3. Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Treat symptomatically.
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SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Water spray, foam, dry powder or carbon dioxide.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

5.2. Special hazards arising from the substance or mixture

Specific hazards	Highly flammable liquid and vapour. Risk of explosion. Vapours may accumulate on the floor and in low-lying areas. Containers can burst violently or explode when heated, due to excessive pressure build-up.
Hazardous combustion products	Carbon dioxide (CO ₂). Carbon monoxide (CO).

5.3. Advice for firefighters

Protective actions during firefighting	Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Approach the spillage from upwind. Avoid inhalation of vapours and contact with skin and eyes. Wear adequate protective equipment at all operations.
For emergency responders	Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Avoid the accumulation of vapours in low or confined areas. Use only in well-ventilated areas. Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharge.

6.2. Environmental precautions

Environmental precautions	Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Contain spillage with sand, earth or other suitable non-combustible material. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.
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6.3. Methods and material for containment and cleaning up

Neste Renewable Naphtha

Methods for cleaning up Immediately start clean-up of the liquid and contaminated soil. Absorb spillage with sand or other inert absorbent. Pay attention to the fire and health hazards caused by the product.

6.4. Reference to other sections

Reference to other sections For personal protection, see Section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Usage precautions The product contains volatile substances which may spread in the atmosphere. Vapours may accumulate on the floor and in low-lying areas. Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. Use explosion-proof electrical equipment.

Use only outdoors or in a well-ventilated area. Try to avoid product volatilization during handling and transferring. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Clear up spills immediately and dispose of waste safely. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

7.2. Conditions for safe storage, including any incompatibilities

Storage precautions Flammable liquid storage. Store in accordance with local regulations. Protect from sunlight. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Vapour from residual product may create a highly flammable or explosive atmosphere inside the container. Keep container tightly closed. Only store in correctly labelled containers. Use containers made of the following materials: Stainless steel. Mild steel.

7.3. Specific end use(s)

Specific end use(s) Not known.

SECTION 8: Exposure controls/Personal protection

8.1. Control parameters

Occupational exposure limits

Solvent naphtha, group 4: 100 mg/m³ (8h), HTP 2020/FIN.

n-Hexane: 20 ppm (8h), 72 mg/m³ (8h), HTP 2020/FIN, EU OELV (EC/2006/15). (skin)

The individual limit values can be applied for the hydrocarbons.

PNEC Not available.

Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich

DNEL

Workers - Inhalation; Long term systemic effects: 93 mg/m³
 Workers - Dermal; Long term systemic effects: 13 mg/kg/day
 Consumer - Inhalation; Long term systemic effects: 20 mg/m³
 Consumer - Dermal; Long term systemic effects: 7 mg/kg/day
 Consumer - Oral; Long term systemic effects: 6 mg/kg/day

8.2. Exposure controls

Appropriate engineering controls Handle product within a predominantly closed system provided with extract ventilation. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).

Neste Renewable Naphtha

Eye/face protection	Spectacles.
Hand protection	Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber. The breakthrough time for any glove material may be different for different glove manufacturers. Protective gloves according to standard EN 374. Change protective gloves regularly.
Other skin and body protection	Protective clothing when needed. Wear anti-static protective clothing if there is a risk of ignition from static electricity.
Respiratory protection	Respiratory protection must be used if the airborne contamination exceeds the recommended occupational exposure limit. Wear a respirator fitted with the following cartridge: Gas filter, type AX. Filter must be changed often enough. Gas and combination filter cartridges suitable for intended use should be used.
Environmental exposure controls	Store in a demarcated bunded area to prevent release to drains and/or watercourses.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Mobile liquid.
Colour	Clear.
Odour	Hydrocarbons.
Odour threshold	-
pH	-
Melting point	< - 60°C (EEC A1/A2)
Initial boiling point and range	> 40 - 170°C (EN ISO 3405)
Flash point	< 0°C (EEC A9)
Upper/lower flammability or explosive limits	Upper flammable/explosive limit: 8,0 % Lower flammable/explosive limit: 1,2 % (ASTM E681)
Vapour pressure	18,5 kPa @ 20°C (EEC A4)
Vapour density	-
Relative density	~ 0,67 (EEC A3 & OECD 109)
Solubility(ies)	0,58 mg/l (EEC A6 & OECD 105)
Partition coefficient	log Pow: 5,8 (EEC A8 & OECD 107)
Auto-ignition temperature	~ 255°C (EC A15)
Decomposition Temperature	-
Viscosity	Kinematic viscosity ~ 0,5 mm ² /s @ 25°C (OECD 114). Dynamic viscosity 0,36 mPa s @ 20°C
Explosive properties	Not considered to be explosive.
Oxidising properties	Does not meet the criteria for classification as oxidising.

9.2. Other information

Other information	Not known.
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SECTION 10: Stability and reactivity

10.1. Reactivity

Neste Renewable Naphtha

Reactivity There are no known reactivity hazards associated with this product.

10.2. Chemical stability

Stability Stable at normal ambient temperatures.

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions No potentially hazardous reactions known.

10.4. Conditions to avoid

Conditions to avoid Keep away from heat, sparks and open flame.

10.5. Incompatible materials

Materials to avoid Oxidising agents.

10.6. Hazardous decomposition products

Hazardous decomposition products None known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Toxicological effects Based on available data the classification criteria are not met.

Skin corrosion/irritation

Skin corrosion/irritation Irritating to skin. (OECD TG 404) The product irritates mucous membranes and may cause abdominal discomfort if swallowed. May cause respiratory irritation.

Serious eye damage/irritation

Serious eye damage/irritation Based on available data the classification criteria are not met. (OECD TG 405)

Skin sensitisation

Skin sensitisation Based on available data the classification criteria are not met. (OECD 429).

Germ cell mutagenicity

Genotoxicity - in vitro Based on available data the classification criteria are not met. (OECD 471, 473, 476).

Genotoxicity - in vivo Based on available data the classification criteria are not met. (OECD 475).

Carcinogenicity

Carcinogenicity Based on available data the classification criteria are not met. (OECD TG 453)

Reproductive toxicity

Reproductive toxicity - fertility Suspected of damaging fertility or the unborn child. (OECD 414, 416).

Specific target organ toxicity - single exposure

STOT - single exposure May cause nausea, headache, dizziness and intoxication. Anaesthetic in high concentrations. (OECD 424)

Specific target organ toxicity - repeated exposure

STOT - repeated exposure May cause damage to organs (Nervous system) through prolonged or repeated exposure. (OECD 414)

Aspiration hazard

Aspiration hazard May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.

Toxicological information on ingredients.

Neste Renewable Naphtha

Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich

Acute toxicity - oral

Notes (oral LD₅₀) LD₅₀ 16750 mg/kg, Oral, Rat (OECD 401)

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ 3350 mg/kg, Dermal, Rabbit (OECD 402)

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LC₅₀ 259400 mg/m³, Inhalation, Rat (4h) (OECD 403)

SECTION 12: Ecological information

12.1. Toxicity

Toxicity Toxic to aquatic life with long lasting effects.

Ecological information on ingredients.

Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich

Acute aquatic toxicity

Acute toxicity - fish LL₅₀, 96 hours: 13,3 mg/l, Fish (QSAR)

Acute toxicity - aquatic invertebrates EL50, 48 hours: 23,2 mg/l, (QSAR)

Acute toxicity - aquatic plants EL50, 72 hours: 9,9 mg/l, Algae
NOELR, 72 hours: 2,2 mg/l, Algae (QSAR)

Chronic aquatic toxicity

Chronic toxicity - fish early life stage NOELR, 28 days: 3,0 mg/l, Fish (QSAR)

Chronic toxicity - aquatic invertebrates NOELR, 21 days: 5,2 mg/l, (QSAR)

12.2. Persistence and degradability

Persistence and degradability The product contains volatile substances which may spread in the atmosphere. Can be photodegraded in the atmosphere.

Stability (hydrolysis) No significant reaction in water.

Biodegradation Inherently biodegradable.

Ecological information on ingredients.

Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich

Biodegradation Rapidly degradable (OECD 301 F)

12.3. Bioaccumulative potential

Bioaccumulative potential Possibly bioaccumulative.

Partition coefficient log Pow: 5,8 (EEC A8 & OECD 107)

12.4. Mobility in soil

Neste Renewable Naphtha

Mobility	Volatile. Volatilization is the fastest and most dominant elimination process in surface water and soil. Product can penetrate soil until reaching ground water, where the most soluble components will spread. The product contains substances which are bound to particulate matter and are retained in soil.
Adsorption/desorption coefficient	Log Koc 3,3 Estimated value.
Surface tension	~ 19 mN/m @ 25°C (ASTM D 971M).

12.5. Results of PBT and vPvB assessment

Results of PBT and vPvB assessment This product does not contain any substances classified as PBT or vPvB.

12.6. Other adverse effects

Other adverse effects None known.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal methods Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. This material and its container must be disposed of as hazardous waste. When handling waste, the safety precautions applying to handling of the product should be considered.

SECTION 14: Transport information

Sea transport notes This cargo is considered an Energy-rich fuel and effective 1 January 2019 should be carried subject to Annex I of MARPOL, see Annex 12 of MEPC.2/Circ.24. Please also refer to MEPC.1/Circ.879 - GUIDELINES FOR THE CARRIAGE OF ENERGY-RICH FUELS AND THEIR BLENDS

14.1. UN number

UN No. (ADR/RID) 3295

14.2. UN proper shipping name

Proper shipping name (ADR/RID) UN 3295, HYDROCARBONS, LIQUID, N.O.S.

Proper shipping name (ADN) UN 3295, HYDROCARBONS, LIQUID, N.O.S. (Alkanes (C5-C7), linear and branched)

14.3. Transport hazard class(es)

ADR/RID class 3

ADN subsidiary risk N2

14.4. Packing group

ADR/RID packing group II

14.5. Environmental hazards

Environmentally hazardous substance/marine pollutant
MARINE POLLUTANT

14.6. Special precautions for user

Hazard Identification Number (ADR/RID) 33

Neste Renewable Naphtha

Tunnel restriction code (D/E)

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Bulk (MARPOL 73/78, Annex I): Energy-rich fuels
Annex II of MARPOL 73/78
and the IBC Code

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulations UK Registration number: UK-01-5347079321-6-0001 (Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich).
Only Representative UK: Penman Consulting Limited 41, Aspect House, Waylands Avenue, Grove Business Park, Wantage, Oxon, OX12 9FF, United Kingdom; Telephone: 01367 718474, Email: pcltd41@penmanconsulting.com.
Location of manufacture: Neste Rotterdam Refinery, the Netherlands.

15.2. Chemical safety assessment

A chemical safety assessment has been carried out.

SECTION 16: Other information

Abbreviations and acronyms used in the safety data sheet DNEL = Derived No-Effect Level
PNEC = Predicted No-Effect Concentration

Key literature references and sources for data Regulations, databases, literature, own research. Chemical Safety Report Hydrocarbons, C5-C7, n-alkanes, isoalkanes, n-hexane rich, 2012.

Revision comments Updated, sections: 3 (CAS nr. outside EU & UK).
NOTE: Lines within the margin indicate significant changes from the previous revision.

Revision date 25/03/2022

Supersedes date 15/03/2022

SDS number 5572

Hazard statements in full H225 Highly flammable liquid and vapour.
H304 May be fatal if swallowed and enters airways.
H315 Causes skin irritation.
H336 May cause drowsiness or dizziness.
H361f Suspected of damaging fertility.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

Exposure scenario

Manufacture of Substance - Industrial

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES01

1. Title of exposure scenario

Main title	Manufacture of Substance - Industrial
Process scope	Use as an intermediate Manufacture of the substance or use as a process chemical or extraction agent. Includes recycling/recovery, material transfers, storage, maintenance and loading (including marine vessel/barge, road/rail car and bulk container), sampling and associated laboratory activities.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals
Environment	
Environmental release category	ERC1 Manufacture of the substance ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
SPERC	ESVOC SPERC 1.1.v1
Worker	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Frequency and duration of use

Continuous release.
Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 5.0E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 3.0E-03
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 1.0E-04

Environmental factors not influenced by risk management measures

Manufacture of Substance - Industrial

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.

STP type Municipal STP.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Removal efficiency (total): 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 340 tonne/day
Assumed domestic sewage treatment plant flow (m³/day):
10 000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 90%.

Water Provide onsite wastewater removal efficiency of $\geq 31.5\%$. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Risk from environmental exposure is driven by freshwater sediment.

Conditions and measures related to external treatment of waste for disposal

Waste treatment During manufacturing no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Assumes a good basic standard of occupational hygiene is implemented.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Manufacture of Substance - Industrial

General exposures (closed systems)

No specific measures identified.

.

General exposures (closed systems)

Continuous process

Handle substance within a closed system.

.

General exposures (closed systems)

Batch process

Ensure material transfers are under containment or extract ventilation.

.

General exposures (open systems)

Batch process

Ensure material transfers are under containment or extract ventilation.

.

Process sampling

Dedicated facility

Ensure material transfers are under containment or extract ventilation.

.

Laboratory activities

Handle in a fume cupboard or under extract ventilation.

.

Bulk transfers

(open systems)

Dedicated facility

Provide extract ventilation to points where emissions occur.

.

Bulk transfers

(closed systems)

Dedicated facility

Ensure material transfers are under containment or extract ventilation.

.

Equipment cleaning and maintenance

Non-dedicated facility

Provide enhanced general ventilation by mechanical means.

Drain down and flush system prior to equipment break-in or maintenance.

.

Storage

General exposures (closed systems)

No specific measures identified.

.

Storage

General exposures (closed systems)

Continuous process

Provide extract ventilation to material transfer points and other openings.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Manufacture of Substance - Industrial

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated
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4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Distribution of Substance - Industrial

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES02

1. Title of exposure scenario

Main title	Distribution of Substance - Industrial
Process scope	Loading (including marine vessel/barge, rail/road car and IBC loading) and repacking (including drums and small packs) of substance, including its sampling, storage, unloading distribution and associated laboratory activities.
Main sector	SU3 Industrial uses
Sector of use	SU8 Manufacture of bulk, large-scale chemicals (including petroleum products) SU9 Manufacture of fine chemicals
Environment	
Environmental release category	ERC1 Manufacture of the substance ERC2 Formulation into mixture ERC3 Formulation into solid matrix ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article) ERC5 Use at industrial site leading to inclusion into/onto article ERC6a Use of intermediate ERC6b Use of reactive processing aid at industrial site (no inclusion into or onto article) ERC6c Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) ERC7 Use of functional fluid at industrial site
SPERC	ESVOC SPERC 1.1b.v1
Worker	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4 Chemical production where opportunity for exposure arises PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Frequency and duration of use

Distribution of Substance - Industrial

Continuous release.
Emission days: 20 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air Release fraction to air from process (initial release prior to RMM): 1.0E-03
Emission factor - water Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil Release fraction to soil from process (initial release prior to RMM): 1.0E-05

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.
STP type Municipal STP.
STP details Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Removal efficiency (total): 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 21,000 tonne/day
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 90%.
Water No wastewater treatment required.
Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
 Risk from environmental exposure is driven by freshwater sediment.

Conditions and measures related to external treatment of waste for disposal

Waste treatment External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid
Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Distribution of Substance - Industrial

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
<u>Risk management measures</u>	<p>General exposures (closed systems) No specific measures identified.</p> <p>.</p> <p>General exposures (closed systems) Continuous process Batch process Ensure material transfers are under containment or extract ventilation.</p> <p>.</p> <p>General exposures (open systems) Batch process Ensure material transfers are under containment or extract ventilation.</p> <p>.</p> <p>Process sampling Batch process Ensure material transfers are under containment or extract ventilation.</p> <p>.</p> <p>Laboratory activities Handle in a fume cupboard or under extract ventilation.</p> <p>.</p> <p>Bulk transfers (closed systems) Dedicated facility Ensure material transfers are under containment or extract ventilation.</p> <p>.</p> <p>Bulk transfers (open systems) Dedicated facility Wear a respirator conforming to EN140 with Type A filter or better.</p> <p>.</p> <p>Drum and small package filling Fill containers/cans at dedicated fill points supplied with local extract ventilation. Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).</p> <p>.</p> <p>Equipment cleaning and maintenance Non-dedicated facility Provide enhanced general ventilation by mechanical means. Transfer via enclosed lines. Retain drain-downs in sealed storage pending disposal or for subsequent recycle.</p> <p>.</p> <p>Storage General exposures (closed systems) No specific measures identified.</p> <p>.</p> <p>Storage General exposures (closed systems) Continuous process Ensure material transfers are under containment or extract ventilation.</p>

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method)
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Distribution of Substance - Industrial

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Formulation & (Re)packing of Substance and Mixtures - Industrial

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES03

1. Title of exposure scenario

Main title	Formulation & (Re)packing of Substance and Mixtures - Industrial
Process scope	Formulation, packing and re-packing of the substance and its mixtures in batch or continuous operations, including storage, materials transfers, mixing, tableting, compression, pelletisation, extrusion, large and small scale packing, sampling, maintenance and associated laboratory activities.
Main sector	SU3 Industrial uses
Sector of use	SU10 Formulation [mixing] of preparations and/or re-packaging
Environment	
Environmental release category	ERC2 Formulation into mixture
SPERC	ESVOC SPERC 2.2.v1
Worker	
Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC4 Chemical production where opportunity for exposure arises</p> <p>PROC5 Mixing or blending in batch processes</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC9 Transfer of substance or mixture into small containers (dedicated filling line, including weighing)</p> <p>PROC14 Tableting, compression, extrusion, pelletisation, granulation</p> <p>PROC15 Use as laboratory reagent.</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)

Frequency and duration of use

Continuous release.
Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (after typical onsite RMMs consistent with EU Solvent Emissions Directive requirements): 2.5E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 2.0E-03

Formulation & (Re)packing of Substance and Mixtures - Industrial

Emission factor - soil Release fraction to soil from process (initial release prior to RMM): 1.0E-04

Environmental factors not influenced by risk management measures

Dilution Local freshwater dilution factor: 10
Local marine water dilution factor: 100

Risk management measures

Good practice Common practices vary across sites, thus conservative process release estimates used.

STP type Municipal STP.

STP details Estimated substance removal from wastewater via domestic sewage treatment: 96.0%
Removal efficiency (total): 96.0%
Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 100 tonne/day
Assumed domestic sewage treatment plant flow (m³/day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air Treat air emission to provide a typical removal efficiency of 0%.

Water Provide onsite wastewater removal efficiency of $\geq 79.5\%$. If discharging to domestic sewage treatment plant, no onsite wastewater treatment required.

Soil Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Risk from environmental exposure is driven by freshwater sediment.

Conditions and measures related to external treatment of waste for disposal

Waste treatment External treatment and disposal of waste should comply with applicable local and/or national regulations.

Conditions and measures related to external recovery of waste

Recovery method External recovery and recycling of waste should comply with applicable local and/or national regulations.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state Liquid

Concentration details Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting Assumes a good basic standard of occupational hygiene is implemented.

Temperature Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Formulation & (Re)packing of Substance and Mixtures - Industrial

General exposures (closed systems)

No specific measures identified.

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General exposures (closed systems)

Continuous process

Batch process

Ensure material transfers are under containment or extract ventilation.

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General exposures (open systems)

Batch process

Provide extract ventilation to points where emissions occur.

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Batch processes at elevated temperatures

(closed systems)

Operation is carried out at elevated temperature (> 20°C above ambient temperature).

Ensure material transfers are under containment or extract ventilation.

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Process sampling

Batch process

Ensure material transfers are under containment or extract ventilation.

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Laboratory activities

Handle in a fume cupboard or under extract ventilation.

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Bulk transfers

Dedicated facility

Ensure material transfers are under containment or extract ventilation.

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Mixing operations

(open systems)

Batch process

Provide extract ventilation to points where emissions occur.

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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Manual

Transfer from/pouring from containers

Non-dedicated facility

Provide extract ventilation to points where emissions occur.

Avoid carrying out activities involving exposure for more than 4 hours.

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Drum/batch transfers

Dedicated facility

Provide extract ventilation to points where emissions occur.

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Production of preparations or articles by tableting, compression, extrusion, pelletisation

Handle substance within a predominantly closed system provided with extract ventilation.

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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Drum and small package filling

Minimise exposure by partial enclosure of the operation or equipment and provide extract ventilation at openings.

Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour).

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Equipment cleaning and maintenance

Non-dedicated facility

Formulation & (Re)packing of Substance and Mixtures - Industrial

Provide enhanced general ventilation by mechanical means.
 Drain down and flush system prior to equipment break-in or maintenance.

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Storage

General exposures (closed systems)

No specific measures identified.

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Storage

General exposures (closed systems)

Continuous process

Ensure material transfers are under containment or extract ventilation.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use as a Fuel - Industrial

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES06

1. Title of exposure scenario

Main title	Use as a Fuel - Industrial
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Main sector	SU3 Industrial uses
<u>Environment</u>	
Environmental release category	ERC7 Use of functional fluid at industrial site
SPERC	ESVOC SPERC 7.12a.v1
<u>Worker</u>	
Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities</p> <p>PROC16 Use of fuels</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Frequency and duration of use

Continuous release.
Emission days: 100 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 5.0E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

Use as a Fuel - Industrial

Good practice	Common practices vary across sites, thus conservative process release estimates used.
STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 96.0% Removal efficiency (total): 96.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 21,000 tonne/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air	Treat air emission to provide a typical removal efficiency of 95%.
Water	Prevent leaks and prevent soil/water pollution caused by leaks. No wastewater treatment required.
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Risk from environmental exposure is driven by freshwater sediment.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.
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Conditions and measures related to external recovery of waste

Recovery method	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Use as a Fuel - Industrial

Bulk transfers

Dedicated facility

Provide extract ventilation to points where emissions occur.

Handle substance within a closed system.

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Drum/batch transfers

Dedicated facility

Provide enhanced general ventilation by mechanical means.

Use drum pumps or carefully pour from container.

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General exposures (closed systems)

Handle substance within a closed system.

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General exposures (closed systems)

Continuous process

Ensure material transfers are under containment or extract ventilation.

Handle substance within a closed system.

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General exposures (closed systems)

Use in contained batch processes

Ensure material transfers are under containment or extract ventilation.

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General exposures (closed systems)

Use as a fuel

Provide enhanced general ventilation by mechanical means.

Handle substance within a closed system.

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General exposures (closed systems)

Batch process

Ensure material transfers are under containment or extract ventilation.

Handle substance within a closed system.

.

Equipment cleaning and maintenance

Non-dedicated facility

Limit the substance content in the product to 25%.

Drain down and flush system prior to equipment break-in or maintenance.

Apply vessel entry procedures, including use of forced supplied air.

Wear suitable coveralls to prevent exposure to the skin.

.

Vessel and container cleaning

Non-dedicated facility

Provide extract ventilation to points where emissions occur.

Apply vessel entry procedures, including use of forced supplied air.

Drain down and flush system prior to equipment break-in or maintenance.

Wear suitable coveralls to prevent exposure to the skin.

Wear suitable gloves tested to EN374.

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Storage

General exposures (closed systems)

Store substance within a closed system.

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Storage

General exposures (closed systems)

Continuous process

Provide extract ventilation to material transfer points and other openings.

Use as a Fuel - Industrial

Store substance within a closed system.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use as a Fuel - Professional

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES07

1. Title of exposure scenario

Main title	Use as a Fuel - Professional
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.
Main sector	SU22 Professional uses
Environment	
Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
SPERC	ESVOC SPERC 9.12b.v1
Worker	
Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities PROC16 Use of fuels

2. Conditions of use affecting exposure (Industrial - Environment 1)

Product characteristics

Substance is complex UVCB. Predominantly hydrophobic.

Frequency and duration of use

Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 1.0E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 1.0E-05

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

Use as a Fuel - Professional

Good practice	Common practices vary across sites, thus conservative process release estimates used.
STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 96.0% Removal efficiency (total): 96.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 380 tonne/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air	Treat air emission to provide a typical removal efficiency of 0%.
Water	Prevent leaks and prevent soil/water pollution caused by leaks. No wastewater treatment required.
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Risk from environmental exposure is driven by fresh water.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.
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Conditions and measures related to external recovery of waste

Recovery method	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Use as a Fuel - Professional

Bulk transfers

Dedicated facility

Ensure operation is undertaken outdoors.

Avoid carrying out activities involving exposure for more than 4 hours.

Wear a respirator conforming to EN140 with Type A filter or better.

Handle substance within a closed system.

Clear transfer lines prior to de-coupling.

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Drum/batch transfers

Dedicated facility

Avoid carrying out activities involving exposure for more than 1 hour.

Use drum pumps or carefully pour from container.

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General exposures (closed systems)

Avoid carrying out activities involving exposure for more than 1 hour.

Use drum pumps or carefully pour from container.

.

General exposures (closed systems)

Dedicated facility

Handle substance within a closed system.

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General exposures (closed systems)

Continuous process

Ensure material transfers are under containment or extract ventilation.

Handle substance within a closed system.

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General exposures (closed systems)

Batch process

Ensure material transfers are under containment or extract ventilation.

Provide enhanced general ventilation by mechanical means.

Limit the substance content in the product to 25%.

Handle substance within a closed system.

.

General exposures (closed systems)

Use as a fuel

Ensure material transfers are under containment or extract ventilation.

Handle substance within a closed system.

.

Equipment cleaning and maintenance

Non-dedicated facility

Wear a respirator conforming to EN140 with Type A filter or better.

Drain down system prior to equipment break-in or maintenance.

Wear suitable coveralls to prevent exposure to the skin.

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Vessel and container cleaning

Non-dedicated facility

Provide extract ventilation to points where emissions occur.

Apply vessel entry procedures, including use of forced supplied air.

Drain down system prior to equipment break-in or maintenance.

Wear suitable coveralls to prevent exposure to the skin.

.

Storage

General exposures (closed systems)

Store substance within a closed system.

Use as a Fuel - Professional

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use as a Fuel - Consumer

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES08

1. Title of exposure scenario

Main title	Use as a Fuel - Consumer
Process scope	Covers consumer uses in liquid fuels.
Product category	PC13 Fuels.
Main sector	SU21 Consumer uses
Environment	
Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
SPERC	ESVOC SPERC 9.12c.v1
Non-industrial	
Product sub-category	PC13_1 Liquid: automotive refuelling PC13_2 Liquid: scooter refuelling PC13_3 Liquid: garden equipment - use PC13_4 Liquid: Garden equipment - Refuelling PC13_5 Liquid: lamp oil PC13_6 Liquid: home space heater fuel

2. Conditions of use affecting exposure (Non-industrial - Environment 1)

Product characteristics

Predominantly hydrophobic. Substance is complex UVCB.

Frequency and duration of use

Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 1.0E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 1.0E-05

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
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Risk management measures

Technical measures	Treat air emission to provide a typical removal efficiency of 0%. Prevent leaks and prevent soil/water pollution caused by leaks. No wastewater treatment required. Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
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Use as a Fuel - Consumer

Risk from environmental exposure is driven by fresh water.

STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 96.0% Removal efficiency (total): 96.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 380 tonne/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.
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Conditions and measures related to external recovery of waste

Recovery method	External recovery and recycling of waste should comply with applicable local and/or national regulations.
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2. Conditions of use affecting exposure (Non-industrial - Health 1)

Product characteristics

Physical state	Liquid
Vapour pressure	30 kPa
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

PC13_1 Liquid: automotive refuelling
For each use event, covers use amounts up to 37.5 kg.
.
PC13_2 Liquid: scooter refuelling
For each use event, covers use amounts up to 3.75 kg.
.
PC13_3 Liquid: garden equipment - use
PC13_4 Liquid: Garden equipment - Refuelling
For each use event, covers use amounts up to 750 g.
.
PC13_5 Liquid: lamp oil
For each use event, covers use amounts up to 100 g.
.
PC13_6 Liquid: home space heater fuel
For each use event, covers use amounts up to 3000 g.

Frequency and duration of use

Use as a Fuel - Consumer

PC13_1 Liquid: automotive refuelling
Covers use up to 52 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.05 hours per event.

PC13_2 Liquid: scooter refuelling
Covers use up to 52 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.03 hours per event.

PC13_3 Liquid: garden equipment - use
Covers use up to 26 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 2.00 hours per event.

PC13_4 Liquid: Garden equipment - Refuelling
Covers use up to 26 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.03 hours per event.

PC13_5 Liquid: lamp oil
Covers use up to 52 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.01 hours per event.

PC13_6 Liquid: home space heater fuel
Covers use up to 365 days/year.
Covers use up to 1 time(s)/day.
Covers exposure up to 0.03 hours per event.

Human factors not influenced by risk management

Potentially exposed body parts PC13_1 Liquid: automotive refuelling . PC13_2 Liquid: scooter refuelling . PC13_6 Liquid: home space heater fuel . PC13_5 Liquid: lamp oil : Covers skin contact area up to 210.00 cm². PC13_4 Liquid: Garden equipment - Refuelling : Covers skin contact area up to 420.00 cm².

Other given operational conditions affecting Non-industrial exposure

Setting PC13_1 Liquid: automotive refuelling . PC13_2 Liquid: scooter refuelling . PC13_3 Liquid: garden equipment - use : Covers outdoor use.

Room size PC13_1 Liquid: automotive refuelling . PC13_2 Liquid: scooter refuelling . PC13_3 Liquid: garden equipment - use : Covers use in room size of 100 m³. PC13_4 Liquid: Garden equipment - Refuelling : Covers use in room size of 34 m³. PC13_5 Liquid: lamp oil . PC13_6 Liquid: home space heater fuel : Covers use in room size of 20 m³.

Ventilation rate PC13_4 Liquid: Garden equipment - Refuelling : Covers use in a one car garage (34 m³) under typical ventilation. PC13_5 Liquid: lamp oil . PC13_6 Liquid: home space heater fuel : Covers use under typical household ventilation.

Other given operational conditions affecting Non-industrial exposure

No specific risk management measure identified beyond those operational conditions stated.

3. Exposure estimation (Environment 1)

Assessment method Used Petrorisk model. (Hydrocarbon Block Method)

Use as a Fuel - Consumer

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Assessment method

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use in Laboratories - Industrial

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES09

1. Title of exposure scenario

Main title	Use in Laboratories - Industrial
Process scope	Use of the substance within laboratory settings, including material transfers and equipment cleaning.
Main sector	SU3 Industrial uses
Environment	
Environmental release category	ERC2 Formulation into mixture ERC4 Use of non-reactive processing aid at industrial site (no inclusion into or onto article)
Worker	
Process category	PROC10 Roller application or brushing PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Frequency and duration of use

Continuous release.
Emission days: 20 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 2.5E-02
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 2.5E-02
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 1.0E-04

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
-----------------	---

Risk management measures

Good practice	Common practices vary across sites, thus conservative process release estimates used.
STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 96.0% Removal efficiency (total): 96.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 10 tonne/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Air	Treat air emission to provide a typical removal efficiency of 0%.
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Use in Laboratories - Industrial

Water	No wastewater treatment required.
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed. Risk from environmental exposure is driven by freshwater sediment.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
------------------------	---

Conditions and measures related to external recovery of waste

Recovery method	External recovery and recycling of waste should comply with applicable local and/or national regulations.
------------------------	---

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Laboratory activities
Provide enhanced general ventilation by mechanical means.
.
Cleaning
Brush or roller
Application
Handle in a fume cupboard.
Avoid carrying out activities involving exposure for more than 4 hours.
Wear suitable gloves tested to EN374.

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method)
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4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination.

3. Exposure estimation (Health 1)

Use in Laboratories - Industrial

Assessment method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use in Laboratories - Professional

Identification

Product name	Neste Renewable Naphtha
EU REACH registration number	01-2119497828-14-XXXX
Es reference	RN_ES10

1. Title of exposure scenario

Main title	Use in Laboratories - Professional
Process scope	Use of small quantities within laboratory settings, including material transfers and equipment cleaning.
Main sector	SU22 Professional uses
<u>Environment</u>	
Environmental release category	ERC8a Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
SPERC	ESVOC SPERC 8.17.v1
<u>Worker</u>	
Process category	PROC10 Roller application or brushing PROC15 Use as laboratory reagent.

2. Conditions of use affecting exposure (Industrial - Environment 1)

Frequency and duration of use

Continuous release.
Emission days: 365 days/year

Other given operational conditions affecting environmental exposure

Emission factor - air	Release fraction to air from process (initial release prior to RMM): 0.5
Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 0.5
Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 0

Environmental factors not influenced by risk management measures

Dilution	Local freshwater dilution factor: 10 Local marine water dilution factor: 100
----------	---

Risk management measures

Good practice	Common practices vary across sites, thus conservative process release estimates used.
STP type	Municipal STP.
STP details	Estimated substance removal from wastewater via domestic sewage treatment: 96.0% Removal efficiency (total): 96.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 1.9 kg/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000.

Technical onsite conditions and measures to reduce or limit discharges to air, water and soil

Use in Laboratories - Professional

Air	Treat air emission to provide a typical removal efficiency of 0%.
Water	No wastewater treatment required.
Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.

Conditions and measures related to external treatment of waste for disposal

Waste treatment	External treatment and disposal of waste should comply with applicable local and/or national regulations.
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Conditions and measures related to external recovery of waste

Recovery method	External recovery and recycling of waste should comply with applicable local and/or national regulations.
------------------------	---

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics

Physical state	Liquid
Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).

Amounts used

Not applicable.

Frequency and duration of use

Covers daily exposures up to 8 hours (unless stated differently).

Other given operational conditions affecting workers exposure

Setting	Assumes a good basic standard of occupational hygiene is implemented.
Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Risk management measures

Laboratory activities
 Ensure doors and windows are opened.

.

Cleaning
 Brush or roller
 Application
 Handle in a fume cupboard or under extract ventilation.
 Ensure doors and windows are opened.
 Avoid carrying out activities involving exposure for more than 4 hours.

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method)
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4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet.

3. Exposure estimation (Health 1)

Use in Laboratories - Professional

Assessment method The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated

4. Guidance to check compliance with the exposure scenario (Health 1)

Predicted exposures are not expected to exceed the DN(M)EL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented. Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Safety Data Sheet

Aviation Jet Fuel JET A-1 / Neste **Sustainable Aviation Fuel**



Contents

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1 Identification of the substance / mixture and of the company / undertaking

1.1 Product identifier

Product name	Aviation Jet Fuel JET A-1 / Neste Sustainable Aviation Fuel
Product number	ID 15843

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	Use as a fuel (ES012a, ES012b)
Uses advised against	Consumer professional use. Uses in coatings, cleaning agents, lubricants, metal working fluids/rolling oil, binders and release agents, agrochemicals, road and construction applications. Explosives manufacture and use.

1.3 Details of the supplier of the safety data sheet

Supplier	Neste Oyj Keilaranta 21, Espoo, P.O.B. 95, FIN-00095 NESTE, FINLAND Tel. +358 10 45811 SDS@neste.com (chemical safety)
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1.4 Emergency telephone number


National emergency telephone number	+358-9-471 977, +358-9-4711, Poison Information Centre
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2 Hazards identification

2.1 Classification of the substance or mixture

Classification (EC 1272/2008)	Physical hazards	Flam. Liq. 3 - H226
	Health hazards	Skin Irrit. 2 - H315 STOT SE 3 - H336 Asp. Tox. 1 - H304
	Environmental hazards	Aquatic Chronic 2 - H411

2.2 Label elements

Hazard pictograms	
Signal word	Danger
Hazard statements	H226 Flammable liquid and vapour. H315 Causes skin irritation. H336 May cause drowsiness or dizziness. H304 May be fatal if swallowed and enters airways. H411 Toxic to aquatic life with long lasting effects.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P273 Avoid release to the environment. P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. P331 Do NOT induce vomiting. P261 Avoid breathing vapours. P280 Wear protective gloves.

Contains	Renewable hydrocarbons (kerosine type fraction), Kerosine (petroleum), sweetened, Distillates (petroleum), hydrotreated light; Kerosine - unspecified, Kerosine (petroleum), hydrodesulfurized.
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2.3 Other hazards

Other hazards	Evaporates slowly. May cause eye and respiratory system irritation. Risk of soil and ground water contamination.
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3 Composition / information on ingredients

3.2 Mixtures

Renewable hydrocarbons (kerosine type fraction)			≤ 50%
CAS number: –	REACH registration number:		
	01-2119850115-46		
Classification: Flam. Liq. 3 - H226, Asp. Tox. 1 - H304			
Distillates (petroleum), hydrotreated light; Kerosine - unspecified			0...≥ 50%
CAS number:	EC number:	REACH registration number:	
64742-47-8	265-149-8	01-2119484819-18-XXXX	
Classification: Flam. Liq. 3 - H226, Skin Irrit. 2 - H315, STOT SE 3 - H336, Asp. Tox. 1 - H304, Aquatic Chronic 2 - H411			
Kerosine (petroleum), sweetened			0...≥ 50%
CAS number:	EC number:	REACH registration number:	
91770-15-9	294-799-5	01-2119502385-46-XXXX	
Classification: Flam. Liq. 3 - H226, Skin Irrit. 2 - H315, STOT SE 3 - H336, Asp. Tox. 1 - H304, Aquatic Chronic 2 - H411			
Kerosine (petroleum), hydrodesulfurized			0...≥ 50%
CAS number:	EC number:	REACH registration number:	
64742-81-0	265-184-9	01-2119462828-25-XXXX	
Classification: Flam. Liq. 3 - H226, Skin Irrit. 2 - H315, STOT SE 3 - H336, Asp. Tox. 1 - H304, Aquatic Chronic 2 - H411			

The full text for all R-Phrases and Hazard Statements are displayed in Section 16.

Composition comments	Mixture of renewable raw material fuel, petroleum product and additives. Total aromatics at maximum: 13.5 %. Naphthalene (CAS 91-20-3) < 1%. Toluene (CAS 108-88-3) < 1%. Benzene (CAS 71-43-2) < 0.1 %. * Total content of fossil components ≥ 50%.
Ingredient notes	Renewable hydrocarbons (kerosine type fraction): REACH reg. no. 01-2119850115-46-0000-0002. Identity outside the EU (CAS number and name of the substance): Alkanes, C8-18-branched and linear (CAS 2252265-89-5).

4 First aid measures

4.1 Description of first aid measures

Inhalation	Remove person to fresh air and keep comfortable for breathing. For breathing difficulties, oxygen may be necessary. If breathing stops, provide artificial respiration. Get medical attention if symptoms are severe or persist.
Ingestion	Do not induce vomiting. Get medical attention immediately.

Skin contact	Remove contaminated clothing immediately and wash skin with soap and water. Get medical attention if irritation persists after washing.
Eye contact	Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.

4.2 Most important symptoms and effects, both acute and delayed

General information	Irritating to skin. May irritate eyes. Vapours in high concentrations are narcotic. May cause nausea, headache, dizziness and intoxication. Entry into the lungs following ingestion or vomiting may cause chemical pneumonitis.
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4.3 Indication of any immediate medical attention and special treatment needed

Notes for the doctor	Treat symptomatically.
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5 Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	Water spray, foam, dry powder or carbon dioxide.
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.

5.2 Special hazards arising from the substance or mixture

Specific hazards	Flammable liquid and vapour. Containers can burst violently or explode when heated, due to excessive pressure build-up.
Hazardous combustion products	Carbon dioxide (CO ₂). Carbon monoxide (CO).

5.3 Advice for firefighters

Protective actions during firefighting	Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for firefighters	Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions	Avoid inhalation of vapours and contact with skin and eyes. Wear adequate protective equipment at all operations.
For emergency responders	Prevent unauthorized access. Vapours are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Eliminate all ignition sources if safe to do so. Take precautionary measures against static discharge.

6.2 Environmental precautions

Environmental precautions	Avoid release to the environment. Stop leak if safe to do so. Avoid the spillage or runoff entering drains, sewers or watercourses. Contain spillage with sand, earth or other suitable non-combustible material. Inform the relevant authorities if environmental pollution occurs (sewers, waterways, soil or air). Risk of soil and ground water contamination.
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6.3 Methods and material for containment and cleaning up

Methods for cleaning up	Immediately start clean-up of the liquid and contaminated soil. Small spillages: Absorb spillage with sand or other inert absorbent. Pay attention to the fire and health hazards caused by the product. Take care as floors and other surfaces may become slippery.
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6.4 Reference to other sections

Reference to other sections	For personal protection, see Section 8.
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7 Handling and storage

7.1 Precautions for safe handling

Usage precautions	The product contains volatile substances which may spread in the atmosphere. Avoid heat, flames and other sources of ignition. Take precautionary measures against static discharges. Use only non-sparking tools. Ground/bond container and receiving equipment. All handling should only take place in well-ventilated areas. Avoid inhalation of vapours and contact with skin and eyes. Use personal protective equipment and/or local ventilation when needed. Do not eat, drink or smoke when using this product. Wash hands and any other contaminated areas of the body with soap and water before leaving the work site. Wash contaminated clothing before reuse. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).
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7.2 Conditions for safe storage, including any incompatibilities

Storage precautions	Flammable liquid storage. Vapours may form explosive mixtures with air. Store in accordance with local regulations. Store in a demarcated bunded area to prevent release to drains and/or watercourses. Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations. Only store in correctly labelled containers. Use containers made of the following materials: Carbon steel, Stainless steel. Keep container tightly closed. Protect from sunlight.
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7.3 Specific end use(s)

Specific end use(s)	Not known.
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8 Exposure controls / personal protection

8.1 Control parameters

Occupational exposure limits

Solvent naphtha, group 3: 100mg/m³ (8h), HTP 2018/FIN.

The individual limit values can be applied for the hydrocarbons.

Benzene	Benzene: 1 ppm (8h), 3.25 mg/m ³ , VNa 1267/2019/FIN (binding limit value). May be absorbed through the skin.
Naphthalene	Naphthalene: 1 ppm (8h), 5 mg/m ³ (8h), 2 ppm (15min), 10mg/m ³ (15min), HTP 2018/FIN. Naphthalene: 10 ppm (8h), 50 mg/m ³ (8h), EU OELV (EC/1991/322).
Toluene	Toluene: 25 ppm (8h), 81 mg/m ³ (8h), 100ppm (15min), 380 mg/m ³ (15min), HTP 2018/FIN. Toluene: 50 ppm (8h), 192 mg/m ³ (8h), 100ppm (15min), 384 mg/m ³ (15min), EU OELV (EC/2006/15) May be absorbed through the skin.

PNEC	Not available.
Renewable hydrocarbons (kerosine type fraction)	
DNEL	Workers - Dermal; Long term systemic effects: 42 mg/kg/day. Workers - Inhalation; Long term systemic effects: 147 mg/m ³ .
Category: Kerosines	
DNEL	Consumer - Oral; Long term systemic effects: 18.75 mg/kg bw/day.

8.2 Exposure controls

Appropriate engineering controls	All handling should only take place in well-ventilated areas. Use personal protective equipment and/or local ventilation when needed. Handle in accordance with good industrial hygiene and safety practice. During tank operations follow special instructions (risk of oxygen displacement and hydrocarbons).
Eye/face protection	Tight-fitting safety glasses.
Hand protection	Wear protective gloves. It is recommended that gloves are made of the following material: Nitrile rubber, Neoprene, Polyvinyl chloride (PVC). The selected gloves should have a breakthrough time of at least 8 hours. Protection class 6. Protective gloves according to standard EN 374. Change protective gloves regularly.
Other skin and body protection	Protective clothing when needed. Wear anti-static protective clothing if there is a risk of ignition from static electricity.
Respiratory protection	Filter device/half mask Gas filter, type A2. Filter device could be used maximum 2 hours at a time. Filter devices must not be used in conditions where the oxygen level is low (< 19 vol.-%). At high concentrations a breathing apparatus must be used (self-contained or fresh air hose breathing apparatus). Filter must be changed often enough. Respirator according to standard EN 140.
Environmental exposure controls	Take precautions against leakage by constructing collecting pools and sewerage systems as well as by surfacing the loading and unloading stations.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	Liquid
Colour	Clear
Odour	Hydrocarbons
Odour threshold	-
pH	-
Melting point	< -47°C
Initial boiling point and range	115...300°C (ASTM D 86)
Flash point	≥ 38°C (IP170)
Upper/lower flammability or explosive limits	Lower flammable/explosive limit: 0,6 % Upper flammable/explosive limit: 6 %
Vapour pressure	~ 2 kPa @ 38°C
Vapour density	> 3 (Air = 1.0)
Relative density	0.78...0.84 @ 15/4°C

Solubility(ies)	The product has poor water-solubility. < 50 mg/l @ 20°C
Partition coefficient	log Kow: > 3
Auto-ignition temperature	207...250°C (EN 14522)
Decomposition temperature	-
Viscosity	Kinematic viscosity < 7 mm ² /s @ 40°C (EN ISO 3104) Dynamic viscosity < 4 mPa s @ 20°C (EN ISO 3104)
Explosive properties	Not considered to be explosive.
Oxidising properties	Does not meet the criteria for classification as oxidising.

10.2 Other information

Other information	Not known.
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10 Stability and reactivity

10.1 Reactivity

Reactivity	There are no known reactivity hazards associated with this product.
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10.2 Chemical stability

Stability	Stable at normal ambient temperatures and when used as recommended.
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10.3 Possibility of hazardous reactions

Possibility of hazardous	No potentially hazardous reactions known.
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10.4 Conditions to avoid

Conditions to avoid	Keep away from heat, sparks and open flame.
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10.5 Incompatible materials

Materials to avoid	Oxidising agents.
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10.6 Hazardous decomposition products

Hazardous decomposition products	Does not decompose when used and stored as recommended.
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11 Toxicological information

11.1 Information on toxicological effects

Toxicological effects	Based on available data the classification criteria are not met.
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Skin corrosion/irritation	Irritating to skin. (Kerosines: EPA Guidelines in FR Vol. 44, No. 145, p. 44054-44093). The product irritates mucous membranes and may cause abdominal discomfort if swallowed. May cause respiratory irritation. Renewable hydrocarbons (kerosene type fraction): Not classified. (EC B4)		
Serious eye damage/irritation	Based on available data the classification criteria are not met. (Kerosines: EPA OTS 798.4500, Renewable hydrocarbons (kerosine type fraction): EC B5)		
Skin sensitisation	Based on available data the classification criteria are not met. (Kerosines: OECD 406, EPA OTS 798.4100, Renewable hydrocarbons (kerosine type fraction): EC B6)		
Germ cell mutagenicity	Genotoxicity - in vitro	Based on available data the classification criteria are not met. (Kerosines: OECD 471, modified Ames test, 479; Renewable hydrocarbons (kerosine type fraction): EC B10, B13/14 & B17)	
	Genotoxicity - in vivo	Based on available data the classification criteria are not met. (Kerosines: OECD 479)	
Carcinogenicity	Based on available data the classification criteria are not met. (OECD 451)		
Reproductive toxicity	Reproductive toxicity - fertility	Based on available data the classification criteria are not met. (Kerosines: OECD 415, Renewable hydrocarbons (kerosine type fraction): OECD 416)	
	Reproductive toxicity - development	Based on available data the classification criteria are not met. (Kerosines: OECD 414)	
Specific target organ toxicity - STOT-single exposure	May cause nausea, headache, dizziness and intoxication. Anaesthetic in high concentrations.		
Specific target organ toxicity - STOT-repeated exposure	Based on available data the classification criteria are not met. (Kerosines: OECD 408, 411, 413, Renewable hydrocarbons (kerosene type fraction): OECD 408)		
Aspiration	May be fatal if swallowed and enters airways. Entry into the lungs following ingestion or		
Toxicological information on ingredients			
Renewable hydrocarbons (kerosine type fraction)	Acute toxicity - oral	Notes (oral LD ₅₀)	LD ₅₀ > 2000 mg/kg, Oral, Rat (EC B1 tris)
	Acute toxicity - dermal	Notes (dermal LD ₅₀)	LD ₅₀ > 2000 mg/kg, Dermal, Rat (EC B3)
Category: Kerosines	Acute toxicity - oral	Notes (oral LD ₅₀)	D ₅₀ > 5000 mg/kg, Oral, Rat (OECD 420, EPA OTS 798.1175)
	Acute toxicity - dermal	Notes (dermal LD ₅₀)	LD ₅₀ > 2000 mg/kg, Dermal, Rabbit (OECD 402, EPA OTS 798.1100)
	Acute toxicity - inhalation	Notes (inhalation LC ₅₀)	LC ₅₀ > 5.28 mg/l, Inhalation, Rat (4h) (OECD 403)
Naphthalene	Acute toxicity - oral	ATE oral (mg/kg)	500.0

12 Ecological information

12.1 Toxicity

Toxicity	Toxic to aquatic life with long lasting effects.
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Ecological information on ingredients.		
Renewable hydrocarbons (kerosine type fraction)		
Acute aquatic toxicity	Acute toxicity - fish	LL ₅₀ , 96 hours: > 1000 mg/l, WAF (OECD 203)
	Acute toxicity - aquatic invertebrates	EL50, 48 hours: > 100 mg/l, WAF (OECD 202)
	Acute toxicity - aquatic plants	EL50, 72 hours: > 100 mg/l, WAF (OECD 201)
	Acute toxicity - microorganisms	EC ₅₀ , 3 hours: > 1000 mg/l, Micro-organisms (wastewater sludge) (OECD 209)
Chronic aquatic toxicity	Chronic toxicity - aquatic invertebrates	NOEC, 21 days: 1 mg/l LOEC, 21 days: 3,2 mg/l, Daphnia magna WAF (OECD 211) NOEC, 10 days: 373 mg/kg LC ₅₀ , 10 days: 1200 mg/kg, Sediment organisms (OSPAR Protocols, Part A: Sediment Bioassay, 2005)
Category: Kerosines		
Acute aquatic toxicity	Acute toxicity - fish	LL ₅₀ , 24 hours: 5-17 mg/l, Oncorhynchus mykiss (Rainbow trout) LL ₅₀ , 48 hours: 2-5 mg/l, Oncorhynchus mykiss (Rainbow trout) WAF (OECD 203)
	Acute toxicity - aquatic invertebrates	EL50, 24 hours: 4.6 mg/l, Daphnia magna EL50, 48 hours: 1.4 mg/l, Daphnia magna NOEL, 48 hours: 0.3 mg/l, Daphnia magna WAF (OECD 202)
Acute aquatic toxicity	Acute toxicity - aquatic plants	EL50, 24 hours: 1-3 mg/l, Pseudokirchneriella subcapitata NOEL, 24 hours: 1 mg/l, Pseudokirchneriella subcapitata WAF (OECD 201)
Chronic aquatic toxicity	Chronic toxicity - fish early life stage	NOEL, 28 days: 0.1 mg/l, Oncorhynchus mykiss (Rainbow trout) (QSAR)
	Chronic toxicity - aquatic invertebrates	EL50, 21 days: 0.81 mg/l, Daphnia magna NOEL, 21 days: 0.48 mg/l, Daphnia magna WAF (OECD 211)

12.2 Persistence and degradability

Persistence and degradability	The product contains volatile substances which may spread in the atmosphere. Can be photodegraded in the atmosphere.
Stability (hydrolysis)	No significant reaction in water.

Ecological information on ingredients.

Renewable hydrocarbons (kerosine type fraction)	
Biodegradation	Rapidly degradable (OECD 301B)
Category: Kerosines	
Biodegradation	Inherently biodegradable (OECD 301F)

12.3 Bioaccumulative potential

Bioaccumulative potential	Possibly bioaccumulative
Partition coefficient	log Kow: > 3

12.4 Mobility in soil

Mobility	Evaporates slowly. The product has poor water-solubility. Product can penetrate soil until reaching the surface of ground water. The product contains substances which are bound to particulate matter and are retained in soil.
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12.5 Results of PBT and vPvB assessment

Results of PBT and vPvB assessment	This product does not contain any substances classified as PBT or vPvB.
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12.6 Other adverse effects

Other adverse effects	Product causes fouling, and direct contact produces harmful effects e.g. to birds and vegetation. Adsorbed hydrocarbon residues can be harmful to sediment organisms.
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13 Disposal considerations**13.1 Waste treatment methods**

Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. When handling waste, the safety precautions applying to handling of the product should be considered. Care should be taken when handling emptied containers that have not been thoroughly cleaned or rinsed out. Empty containers or liners may retain some product residues and hence be potentially hazardous.
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14 Transport information

Sea transport notes	This cargo is considered an Energy-rich fuel and effective 1 January 2019 should be carried subject to Annex I of MARPOL, see Annex 12 of MEPC.2/Circ.24. Please also refer to MEPC.1/Circ.879 - GUIDELINES FOR THE CARRIAGE OF ENERGY-RICH FUELS AND THEIR BLENDS.
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14.1 UN number

UN No. (ADR/RID)	1863
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14.2 UN proper shipping name

Proper shipping name (ADR/RID)	UN 1863 FUEL, AVIATION, TURBINE ENGINE
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14.3 Transport hazard class(es)

ADR/RID class	3
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14.4 Packing group

ADR/RID packing group	III
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14.5 Environmental hazards

Environmentally hazardous substance/ marine pollutant	MARINE POLLUTANT
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14.6 Special precautions for user

Hazard Identification Number (ADR/RID)	30
Tunnel restriction code	(D/E)

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable
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15 Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

EU legislation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (as amended). Commission Regulation (EU) No 2015/830 as of 28 May 2015. Regulation (EC) No 1272/2008 of the European Parliament and of the Council as of 16 December 2008 on classification, labelling and packaging of substances and mixtures (as amended).
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15.2 Chemical safety assessment

A chemical safety assessment has been carried out.

16 Other information

Abbreviations and acronyms used in the safety data sheet	EU OELV = European Occupational Exposure Limit Value
Key literature references and sources for data	Regulations, databases, literature, own research. CONCAWE Report 13/17: Hazard classification and labelling of petroleum substances in the EEA - 2017. Chemical Safety Report Distillates (petroleum), hydrotreated light, 2019. Chemical Safety Report Kerosine (petroleum), hydrodesulfurized, 2019. Chemical Safety Report Kerosine (petroleum), sweetened, 2019. Chemical Safety Report Renewable hydrocarbons (kerosene type fraction): 2011.
Training advice	DO NOT SIPHON PRODUCT BY MOUTH SUCTION.
Revision comments	NOTE: Lines within the margin indicate significant changes from the previous revision.
Revision date	11/09/2020
Supersedes date	03/03/2020
SDS number	5641
Hazard statements in full	H226 Flammable liquid and vapour. H304 May be fatal if swallowed and enters airways. H315 Causes skin irritation. H336 May cause drowsiness or dizziness. H411 Toxic to aquatic life with long lasting effects.

Exposure scenario

Use as a Fuel - Industrial

Identification	
Product name	Kerosines
Version number	2018
Es reference	ES12a

1. Title of exposure scenario		
Main title	Use as a Fuel - Industrial.	
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Environment	Environmental release category	ERC7 Use of functional fluid at industrial site.
	SPERC	ESVOC SPERC 7.12a.v1
Worker	Process category	<p>PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions.</p> <p>PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions.</p> <p>PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition.</p> <p>PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities.</p> <p>PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities.</p> <p>PROC16 Use of fuels.</p>

2. Conditions of use affecting exposure (Industrial - Environment 1)		
Product characteristics	Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	Fraction of EU tonnage used in region: 0.1 Regional use tonnage: 1,600,000 tonnes/year Fraction of Regional tonnage used locally: 1 Annual site tonnage: 1,500,000 tonnes Maximum daily site tonnage: 5000 tonnes	
Frequency and duration of use	Continuous release. Emission days: 300 days/year.	
Other given operational conditions affecting environmental exposure	Emission factor - air	Release fraction to air from process (initial release prior to RMM): 5.0E-02
	Emission factor - water	Release fraction to wastewater from process (initial release prior to RMM): 1.0E-05
	Emission factor - soil	Release fraction to soil from process (initial release prior to RMM): 0
Environmental factors not influenced by risk management measures	Dilution	Local freshwater dilution factor: 10
		Local marine water dilution factor: 100

Risk management measures	Good practice	Common practices vary across sites, thus conservative process release estimates used. Risk from environmental exposure is driven by freshwater sediment.
	STP type	Municipal STP.
	STP details	Estimated substance removal from wastewater via domestic sewage treatment: 95.0%. Removal efficiency (total): 95%. Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.1E+06 tonne/day. Assumed domestic sewage treatment plant flow (m ³ /day): 2000.
Technical onsite conditions and measures to reduce or limit discharges to air, water and soil	Air	Treat air emission to provide a typical removal efficiency of 95%.
	Water	Prevent leaks and prevent soil/water pollution caused by leaks. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 94.4. If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0.
	Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.
Conditions and measures related to external recovery of waste	Recovery method	This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics	Physical state	Liquid.
	Vapour pressure	Vapour pressure 0.5 - 10 kPa at STP.
	Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Setting	Assumes a good basic standard of occupational hygiene is implemented.
	Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.
Organisational measures to prevent/limit releases, dispersion and exposure	Organisational measures	General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.

Risk management measures	General exposures (closed systems). No other specific measures identified.
Risk management measures	Use as a fuel (closed systems). No other specific measures identified.
	Bulk transfers. No other specific measures identified.
	Drum/batch transfers. No other specific measures identified.
	Equipment cleaning and maintenance. No other specific measures identified.
	Bulk product storage. No other specific measures identified.

3. Exposure estimation (Environment 1)

Assessment method	Used Petrorisk model. (Hydrocarbon Block Method).
	Maximum Risk Characterisation Ratios for air emissions 2.9E-02 Maximum Risk Characterisation Ratios for wastewater emissions 9.0E-01

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-forindustries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Exposure scenario

Use as a Fuel - Professional

Identification	
Product name	Kerosines
Version number	2018
Es reference	ES12b

1. Title of exposure scenario		
Main title	Use as a Fuel - Professional.	
Process scope	Covers the use as a fuel (or fuel additive) and includes activities associated with its transfer, use, equipment maintenance and handling of waste.	
Environment	Environmental release category	ERC9a Widespread use of functional fluid (indoor) ERC9b Widespread use of functional fluid (outdoor)
	SPERC	ESVOC SPERC 9.12b.v1
Worker	Process category	PROC1 Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. PROC2 Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions. PROC3 Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition. PROC8a Transfer of substance or mixture (charging and discharging) at non-dedicated facilities. PROC8b Transfer of substance or mixture (charging and discharging) at dedicated facilities. PROC16 Use of fuels.

2. Conditions of use affecting exposure (Industrial - Environment 1)		
Product characteristics	Substance is complex UVCB. Predominantly hydrophobic.	
Amounts used	Fraction of EU tonnage used in region: 0.1 Regional use tonnage: 4,600,000 tonnes/year Fraction of Regional tonnage used locally: 1 Annual site tonnage: 2300 tonnes Maximum daily site tonnage: 6.4 tonnes	
Frequency and duration of use	Continuous release Emission days: 365 days/year	
Other given operational conditions affecting environmental exposure	Emission factor - air	Release fraction to air from wide dispersive use (regional only): 1.0E-03
	Emission factor - water	Release fraction to wastewater from wide dispersive use: 1.0E-05
	Emission factor - soil	Release fraction to soil from wide dispersive use (regional only): 1.0E-05
Environmental factors not influenced by risk management measures	Dilution	Local freshwater dilution factor: 10
		Local marine water dilution factor: 100

Risk management measures	Good practice	Common practices vary across sites, thus conservative process release estimates used. Risk from environmental exposure is driven by fresh water.
	STP type	Municipal STP
	STP details	Estimated substance removal from wastewater via domestic sewage treatment: 95.0% Removal efficiency (total): 95.0% Maximum allowable site tonnage (Msafe), based on release following total wastewater treatment removal: 2.9E+05 kg/day Assumed domestic sewage treatment plant flow (m ³ /day): 2000
Technical onsite conditions and measures to reduce or limit discharges to air, water and soil	Air	Treat air emission to provide a typical removal efficiency of N/A%
	Water	Prevent leaks and prevent soil/water pollution caused by leaks. Onsite wastewater treatment required. Treat onsite wastewater (prior to receiving water discharge) to provide the required removal efficiency of (%): 0.0 If discharging to domestic sewage treatment plant, provide the required onsite wastewater removal efficiency of (%): 0.0.
	Soil	Do not apply industrial sludge to natural soils. Sludge should be incinerated, contained or reclaimed.
Conditions and measures related to external treatment of waste for disposal	Waste treatment	Combustion emissions limited by required exhaust emission controls. Combustion emissions considered in regional exposure assessment.
Conditions and measures related to external recovery of waste	Recovery method	This substance is consumed during use and no waste of the substance is generated.

2. Conditions of use affecting exposure (Workers - Health 1)

Product characteristics	Physical state	Liquid.
	Vapour pressure	Vapour pressure 0.5 - 10 kPa at STP.
	Concentration details	Covers percentage substance in the product up to 100% (unless stated differently).
Frequency and duration of use	Covers daily exposures up to 8 hours (unless stated differently).	
Other given operational conditions affecting workers exposure	Setting	Assumes a good basic standard of occupational hygiene is implemented.
	Temperature	Assumes use at not more than 20°C above ambient temperature, unless stated differently.

Organisational measures to prevent/ limit releases, dispersion and exposure	Organisational measures	General measures (skin irritants) Avoid direct skin contact with product. Identify potential areas for indirect skin contact. Wear gloves (tested to EN374) if hand contact with substance likely. Clean up contamination/spills as soon as they occur. Wash off any skin contamination immediately. Provide basic employee training to prevent/minimise exposures and to report any skin problems that may develop.
Risk management measures	General exposures (closed systems). No other specific measures identified.	
	Use as a fuel (closed systems). No other specific measures identified.	
	Bulk transfers. No other specific measures identified.	
	Transfer from/pouring from containers. No other specific measures identified.	
	Equipment cleaning and maintenance. No other specific measures identified.	
	Bulk product storage. No other specific measures identified.	

3. Exposure estimation (Environment 1)

Assessment method	Used Petrорisk model. (Hydrocarbon Block Method)
	Maximum Risk Characterisation Ratios for air emissions 4.4E-04 Maximum Risk Characterisation Ratios for wastewater emissions 3.4E-03

4. Guidance to check compliance with the exposure scenario (Environment 1)

Guidance is based on assumed operating conditions which may not be applicable to all sites, thus, scaling may be necessary to define appropriate site-specific risk management measures. Required removal efficiency for wastewater can be achieved using onsite/offsite technologies, either alone or in combination. Required removal efficiency for air can be achieved using onsite technologies, either alone or in combination. Further details on scaling and control technologies are provided in SpERC factsheet (<http://cefic.org/en/reach-forindustries-libraries.html>).

3. Exposure estimation (Health 1)

Assessment method	The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.
	Available hazard data do not enable the derivation of a DNEL for dermal irritant effects. Qualitative approach used to conclude safe use. Available hazard data do not support the need for a DNEL to be established for other health effects. Users are advised to consider national Occupational Exposure Limits or other equivalent values.

4. Guidance to check compliance with the exposure scenario (Health 1)

Where other Risk Management Measures/Operational Conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Appendix D- Emission Calculations

Submitted on Electronic Media - DEQ Submission Only