

## SAFETY DATA SHEET

**Petroleum Crude Oil**
**Version 1.2 Revision Date: 09/24/2019**
**SECTION 1: IDENTIFICATION**

(a) PRODUCT IDENTIFIER:	(b) OTHER MEANS OF IDENTIFICATION:
Petroleum Crude Oil	Petroleum Crude, Crude oil

**(c) Recommended Use:** Refinery Feedstock

**Restrictions On Use:** Not to be used for anything other than recommended use.




**(d) Producer:**

Chesapeake Energy Corporation and Subsidiaries • 6100 N. Western Avenue, Oklahoma City, OK 73118

Tel: 800-566-9306 • Fax: 405-753-5468

**(e) 24 HR EMERGENCY ASSISTANCE PHONE NUMBER: Verisk 3E – 800-451-8346 / Client ID 11906**
**SECTION 2: HAZARDS IDENTIFICATION**

The categories of Health Hazards as defined in OSHA 29 CFR 1910.1200 Hazard Communication Standard have been evaluated and are listed below. Refer to Sections 3, 8, and 11 for additional information.

Hazard Classification	(a) Hazard Category	(b) Hazard Symbols	(b) Signal Word	(b) Hazard Statement	(b) Precautionary Statements
<b>Human Health Hazards</b>					
<b>Acute Toxicity (Oral)</b>	N/C	-	-	-	-
<b>Acute Toxicity (Dermal)</b>	N/C	-	-	-	-
<b>Acute Toxicity (Inhalation)</b>	N/C	-	-	-	-
<b>Skin Corrosion/Irritation</b>	N/C	-	-	-	-
<b>Eye Damage/Irritation</b>	2A		Warning	Causes serious eye irritation	Wear eye protection P264, P280, P305, P351, P338, P337, P313
<b>Respiratory Sensitization</b>	N/D	-	-	-	-
<b>Skin Sensitization</b>	N/C	-	-	-	-
<b>Germ Cell Mutagenicity</b>	1B		Danger	May cause genetic defects	Wear protective clothing P201, P202, P280, P308, P313, P405, P501
<b>Carcinogenicity</b>	1A		Danger	May cause cancer	Do not handle until all safety precautions have been read and understood P201, P202, P280, P308, P313, P405, P501
<b>Reproductive Toxicity</b>	N/D	-	-	-	-




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Hazard Classification	(a) Hazard Category	(b) Hazard Symbols	(b) Signal Word	(b) Hazard Statement	(b) Precautionary Statements
<b>Human Health Hazards</b>					
Specific Target Organ Toxicity (STOT) Single-Exposure	3		Warning	May cause drowsiness or dizziness	Avoid breathing vapors P261, P271, P304, P340, P312, P403, P405, P233, P501
Specific Target Organ Toxicity (STOT) Repeated or Prolonged Exposure	2		Warning	May cause damage to liver, kidneys, blood, nervous system, spleen, thymus, and skin through prolonged or repeated exposure.	Get medical advice/attention if you feel unwell P260, P314, P501
Aspiration Hazard	1		Danger	May be fatal if swallowed and enters airways	If swallowed: Immediately call a poison center P301, P310, P405, P501
Simple Asphyxiant	-	-	Warning	May displace oxygen and cause rapid suffocation	-

### Health Hazard Precautionary Statement


P201	Obtain special instructions before use.
P202	Do not handle until all safety precautions have been read and understood.
P233	Keep container tightly closed.
P260	Do not breathe dust/fume/gas/mist/vapors/spray.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P264	Wash thoroughly after handling.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/ protective clothing/eye protection/face protection.
P301	If swallowed:
P310	Immediately call a poison center or doctor.
P304	If inhaled:
P340	Remove person to fresh air and keep comfortable for breathing.
P305	If in eyes: Rinse cautiously with water for several minutes.
P351	Remove contact lenses.
P338	Continue rinsing.
P308	If exposed or concerned.
P312	Call a poison center or doctor if you feel unwell.
P314	Get medical advice/attention if you feel unwell.
P337	If eye irritation persists.
P313	Get medical advice/attention.
P403	Store in a well-ventilated place.
P405	Store locked up.

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P501	Dispose of contents/container to an approved facility.
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Hazard Classification	Hazard Category	Hazard Symbols	Signal Word	Hazard Statement	Precautionary Statement
<b>Physical Hazards</b>					
<b>Explosives</b>	N/C	-	-	-	-
<b>Flammable Gases</b>	N/C	-	-	-	-
<b>Flammable Aerosols</b>	N/C	-	-	-	-
<b>Oxidizing Gases</b>	N/C	-	-	-	-
<b>Gases Under Pressure</b>	N/C	-	-	-	-
<b>Flammable Liquids</b>	2		Danger	Highly flammable liquid and vapor	Keep away from heat/sparks/open flames/hot surfaces. No Smoking. P210, P233, P240, P241, P242, P243, P280, P303, P361, P353, P370, P378, P403, P235, P501
<b>Flammable Solids</b>	N/C	-	-	-	-
<b>Self-reactive Substances and Mixtures</b>	N/C	-	-	-	-
<b>Substances and mixtures which react with water to emit flammable gases</b>	N/C	-	-	-	-
<b>Oxidizing Liquids</b>	N/C	-	-	-	-
<b>Oxidizing Solids</b>	N/C	-	-	-	-
<b>Organic Peroxides</b>	N/C	-	-	-	-
<b>Corrosive to Metals</b>	N/C	-	-	-	-


<b>Physical Hazard Precautionary Statement</b>	
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P235	Keep cool.
P240	Ground/Bond container and receiving equipment.
P241	Use explosion-proof electrical/ventilating/lighting/equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P280	Wear protective gloves/eye protection/face protection.
P303	If on skin or hair:
P361	Remove/take off immediately all contaminated clothing.
P353	Rinse skin with water/shower.
P370	In case of fire.
P378	Use dry chemical, carbon dioxide, or foam to extinguish.
P403	Store in a well-ventilated place.

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Physical Hazard Precautionary Statement	
P501	Dispose of contents/container to an approved disposal facility.

Hazard Classification	(a) Hazard Category	(b) Hazard Symbols	(b) Signal Word	(b) Hazard Statement	(b) Precautionary Statement
<b>Environmental Hazards</b>					
<b>Acute Toxicity to the Aquatic Environment</b>	2	-	-	Toxic to aquatic life	-
<b>Chronic Toxicity to the Aquatic Environment</b>	2		-	Toxic to aquatic life with long lasting effects	-

**(c) Hazards not otherwise classified:** This material may contain or release poisonous hydrogen sulfide. In high doses, hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. Exposure to hydrocarbon can sensitize the myocardium to epinephrine-induced cardiac arrhythmias.

**(d) Unknown acute toxicity:** approximately 16% of this mixture consists of ingredients of unknown acute toxicity.

**(e) Medical conditions which are generally recognized as being aggravated by exposure:** Individuals with pre-existing central nervous system disease, chronic respiratory diseases, skin or eye disorders, or impaired liver or kidney function may be at increased risk from exposure.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS				
Hydrocarbon Ranges	(a) Chemical name (b) (Common name and synonyms)	(c) CAS No.	(c) EC No.	(b) % Weight
	<b>Crude Oil</b>	8002-05-9	232-298-5	100 %
	<b>Components</b>			
<b>Aliphatic</b>				
C <sub>1</sub> – C <sub>3</sub>	Asphyxiant gases (methane, ethane, propane)	-	-	0 – 2
C <sub>4</sub>	Butane (all isomers)	68513-65-5	271-009-7	1 – 8
C <sub>5</sub>	Pentanes	-	-	1 – 12
C <sub>6</sub> – C <sub>8</sub>	“Light aliphatic” (C <sub>7</sub> – C <sub>9</sub> aliphatic hydrocarbons; heptane)	-	-	17 – 43
	n-Hexane	110-54-3	203-777-6	1 – 8
C <sub>9</sub> – C <sub>18</sub>	“Mid-range aliphatic” (C <sub>&gt;8</sub> -C <sub>16</sub> aliphatic hydrocarbons)	-	-	19 – 65
C <sub>19</sub> – C <sub>32</sub>	“Heavy aliphatic” (C <sub>19</sub> -C <sub>32</sub> aliphatic hydrocarbons)	-	-	10 - 64
<b>Aromatic</b>				
C <sub>6</sub>	Benzene	71-43-2	200-753-7	0.1 – 1
C <sub>7</sub> – C <sub>8</sub>	Ethylbenzene	100-41-4	202-849-4	0.1 – 4
	Toluene	108-88-3	203-625-9	1 – 4
	Xylenes	1330-20-7	215-535-7	1 – 7
C <sub>9</sub> – C <sub>16</sub>	“Mid-range aromatic” (C <sub>&gt;8</sub> -C <sub>16</sub> aromatic hydrocarbons)	-	-	6 – 12
C <sub>17</sub> – C <sub>32</sub>	“Heavy aromatic” (C <sub>17</sub> -C <sub>32</sub> aromatic hydrocarbons)	-	-	0 – 0.5
	Hydrogen sulfide	7783-06-4	231-977-3	< 0.5 - 1 variable

\*Crude oil is a complex combination of hydrocarbons. It consists predominantly of aliphatic, alicyclic and aromatic hydrocarbons with a range of carbon numbers between C1 and C60+. It may also contain small amounts of nitrogen, oxygen and sulfur compounds. The concentration ranges listed above are based on specific testing results and reported industry values. Composition of crude oil varies depending on the source of crude.

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### SECTION 4: FIRST AID MEASURES

**(a) Description of necessary measures:**

**Emergency Medical advice is available from regional poison control centers 1-800-222-1222.**

<b>INHALATION:</b>	Move to fresh air immediately. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
<b>INGESTION:</b>	Rinse mouth. There is a potential for aspiration if swallowed. Do not induce vomiting. If vomiting occurs, place on left side and keep head low. Seek medical help immediately.
<b>SKIN CONTACT:</b>	If on skin: Wash with plenty of mild soap and water. If skin irritation occurs: Get medical advice/attention. Remove contaminated clothing immediately and wash it before reuse.
<b>EYE CONTACT:</b>	Flush eyes immediately with water for 15 minutes while holding eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

**(b) Most important symptoms/effects:**

- **Acute:** Headache, drowsiness, loss of mental alertness and coordination, dizziness, nausea.
- **Delayed:** Dry skin and possible irritation with repeated or prolonged exposure.

**(c) Indication of immediate medical attention and special treatment:** Significant over-exposure

**Notes to physician:** Treat symptomatically and supportively. This material may contain or release hydrogen sulfide. In high doses, hydrogen sulfide may produce pulmonary edema and respiratory depression or paralysis. Exposure to hydrocarbon can sensitize the myocardium to epinephrine-induced cardiac arrhythmias. If epinephrine or other sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

**General advice:** In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Show this safety data sheet to the doctor in attendance. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

### SECTION 5: FIRE FIGHTING MEASURES

**(a) Suitable extinguishing media:** Foam, Dry chemical, carbon dioxide, water spray can cool the fire but may not extinguish the fire.

**Unsuitable extinguishing media:** High volume water jet. It will spread the fire.

**(b) Specific hazards arising from the chemical:** Crude oil is a highly flammable liquid and vapor. It can be ignited by heat, spark, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, and pagers which have not been certified as intrinsically safe). Vapors can travel considerable distances to spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low-lying areas. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous combustion/decomposition products may be released by this material when exposed to heat or fire. Use caution and wear appropriate PPE, including respiratory protection and flame retardant clothing.

**(c) Special protective equipment and precautions for fire-fighters:** Shut off flow immediately if it can be done safely. Isolate the area from personnel. Keep personnel upwind from fire. Fire fighters should use appropriate Self-Contained Breathing Apparatus (SCBA) while in close proximity to fire and vapors coming from product. Move personnel upwind of any smoke or vapors. Firefighters need to wear full protective clothing. Cool tanks, shells, and containers exposed to fire

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and excessive heat with water. For massive fires, use unmanned hose holders or monitor nozzles to avoid personnel exposures. Such fires may require withdrawal, allowing the tank to burn.

In the event of fire and/or explosion, do not breathe fumes.

**(d) Flammability/Explosivity:** NFPA RATING Hazard Class:  
 Health = 1  
 Fire = 4  
 Instability = 0  
 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

**(e) Hazardous Decomposition Products:** Normal combustion forms carbon dioxide and water vapor; incomplete combustion may produce carbon monoxide.

### SECTION 6: ACCIDENTAL RELEASE MEASURES

**(a) Personal precautions, Protective equipment, and Emergency procedures:** Crude oil is highly flammable. Stay upwind if possible. Eliminate all ignition sources. Avoid inhalation of vapors and spray mist. Avoid contact with skin and eyes. Wear appropriate PPE including respiratory protection as needed. On hard surfaces, spilled crude oil may create a slipping hazard.

Federal regulations (29 CFR 1910.1028) specify medical surveillance programs for certain exposures to benzene. Additionally, in an emergency situation, exposed employees may need to provide a urine sample at the end of shift for urine phenol.

**(b) Methods and materials for containment and cleaning up:** Remove sources of ignition. Beware of explosion danger. Stop flow of product, if it is safe to do so. Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended if possible. Dike the spilled material. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water, remove with appropriate methods (e.g., skimming, booms, or absorbent boom). In the case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations. Recommended measures are based on the most likely spill scenarios for this material; however, local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

**Environmental Precautions:** Prevent product from entering drains or sanitary sewers. Prevent further leakage or spillage if safe to do so. If product impacts rivers, lakes, drains, or any other body of water, contact appropriate authorities. Consult with an environmental professional for the federal, state, and local cleanup and reporting requirements.

### SECTION 7: HANDLING AND STORAGE

**(a) Precautions for safe handling:** Keep away from ignition sources such as heat/sparks/open flame. Take precautionary measures against static discharge. Non-sparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink, or smoke when using this product. Do not breathe vapors or mists. Use only outdoors or in well-ventilated area. Wear protective gloves/clothing and eye/face protection. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment.

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Crude oil is highly flammable. It may vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low-lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static-electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames. Avoid vapors when opening tank hatches and dome covers.

Static Accumulation Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding of tanks, transfer piping, and storage tank level floats are 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. Special care should be given to ensure that slow load procedures for “switch loading” are followed to avoid the static ignition hazard that can exist when higher flash point material (such as fuel oil or diesel) is loaded into tanks previously containing low flash point products (such as gasoline or naphtha). For more information, refer to OSHA Standard 29 CFR 1910.106 ‘Flammable and Combustible Liquids’, National Fire Protection Association (NFPA 77, ‘Recommended Practice on Static Electricity’, and/or the American Petroleum Institute (API) Recommended Practice 2003, ‘Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents’.

**(b) Conditions for safe storage, including any incompatibilities:**

Store in appropriate containers or tankage and in accordance with local regulations. Store in a segregated and approved well-ventilated, cool, dry area. Use appropriate containment to avoid environmental contamination. Keep containers properly labeled. Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

“Empty” containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, drill, grind or expose containers to heat, flame, sparks, or other sources of ignition. All containers should be disposed of in an environmentally safe manner and in accordance with applicable regulations.

### SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Components	(a) OSHA PEL <sup>1</sup>	(a) ACGIH TLV <sup>2</sup>	(a) IDLH <sup>3</sup>
Crude Oil	NE	NE	NE
Propane	1,000 ppm (TWA)	NE	2,100 ppm
Butane (all isomers)	NE	1,000 ppm (C)	NE
Pentane (all isomers)	1,000 ppm (TWA)	1,000 ppm (TWA)	1,500 ppm
“Light aliphatic” hydrocarbons	NE	NE	NE
n-Hexane	500 ppm (TWA)	50 ppm (TWA) Skin	1,100 ppm



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"Mid-range aliphatic" hydrocarbons	NE	NE	NE
"Heavy aliphatic" hydrocarbons	NE	NE	NE
Benzene	1 ppm (TWA) 5 ppm (STEL)	0.5 ppm (TWA) 2.5 ppm (STEL) Skin	500 ppm
Ethylbenzene	100 ppm (TWA)	20 ppm (TWA)	800 ppm
Toluene	200 ppm (TWA) 300 ppm (C)	20 ppm (TWA)	500 ppm
Xylenes	100 ppm (TWA)	100 ppm (TWA) 150 ppm (STEL)	900 ppm
"Mid-range aromatic" hydrocarbons	NE	NE	NE
"Heavy aromatic" hydrocarbons	NE	NE	NE
Hydrogen sulfide	20 ppm (C)	1 ppm (TWA) 5 ppm (STEL)	100 ppm

**Notes:**

1. OSHA PEL are 8-hour TWA (Time-weighted average) concentrations unless otherwise noted. A ("C") designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. A Short Term Exposure Limit (STEL) is defined as a 15-minute exposure, which should not be exceeded at any time during a workday.
2. Threshold Limit Values – TWA established by the ACGIH represents the TWA concentration for a conventional 8-hour workday and a 40-hour workweek, to which it is believed that nearly all workers may be repeatedly exposed, day after day, for a working lifetime without adverse effect; Short-Term Exposure Limit (TLV-STEL) represents a 15-minute TWA exposure that should not be exceeded at any time during a work day. ACGIH TLV's are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes (ACGIH, 2014).
3. The "immediately dangerous to life or health air concentration values (IDLHs)" are used by NIOSH as part of a respiratory selection criteria.
4. No exposure limits have been developed by the producer.
5. NE – None established.

**(b) Appropriate engineering controls:** Provide adequate general and local ventilation to maintain airborne chemical concentrations below applicable exposure limits, to prevent accumulation of flammable vapors and formation of explosive atmosphere, and to prevent formation of an oxygen deficient environment. Use non-sparking explosion proof, totally enclosed ventilation systems. Only use non-sparking tools, if engineering controls or work activities 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.

**Eye/face protection:** Wear approved safety glasses/goggles with side shields and/or an appropriate full-face shield. All eye protection should be selected and worn in accordance with the OSHA eye and face protection guidelines outlined in 29 CFR 1910.132 and 1910.133; and/or CSA Standard CAN/CSA-Z94.3-92.

**Skin Protection:** Wear appropriate clothing to prevent skin contact. Thoroughly decontaminate any articles of clothing that come into contact with product. The use of gloves is advised to prevent skin exposure and contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Depending on exposure and conditions, additional protection may be necessary to prevent skin contact including items such as chemical resistant boots, aprons, arm covers, hoods, coveralls, or encapsulated suits. All PPE should be selected and worn in accordance



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with 29 CFR 1910.132 and 1910.138. Flame resistant clothing that meets the NFPA 212 and CAN/CGSB 155.20 standards is recommended in areas where material is stored or handled.

**Respiratory protection:** A positive pressure air line with full-face mask and escape bottle or a self-contained breathing apparatus (SCBA) should be available in case of an emergency and cases when the IDLH is exceeded. All respirators should be selected and worn in accordance with 29 CFR 1910.132 and 1910.134; and/or CSA Standard CAN/CSA-Z94.4-11. Respiratory protection is not required during normal use in well-ventilated areas.

**General hygiene considerations:** Always observe good personal hygiene measures, such as washing after handling the material, and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**General:** Wear chemical protective equipment. Launder contaminated clothing before reuse.

### SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties	
	Solution:
<b>(a) Appearance:</b>	Depending on its source, the typical color ranges from amber to brown to greenish black.
<b>(b) Odor:</b>	Petroleum/asphalt type with a sulfur or rotten egg odor if H <sub>2</sub> S or other sulfur compounds are present
<b>(c) Odor Threshold:</b>	N/A
<b>(d) pH:</b>	N/A
<b>(e) Melting point/Freezing point:</b>	N/A
<b>(f) Initial Boiling point:</b>	88° - 160 °F (AS-D-86)
<b>Bubble point</b>	85 – 131 °F
<b>(g) Flash Point:</b>	<32 °F (AS-D-93)
<b>(h) Evaporation rate:</b>	N/A
<b>(i) Flammability:</b>	N/A
<b>(j) UFL/LFL or UEL/LEL:</b>	UFL 15% / LFL 0.4%
<b>(k) Vapor pressure:</b>	2.47 – 13.78 psi (AS-D-6377)
<b>(l) Vapor density:</b>	3 – 5 typical
<b>(m) Density:</b>	0.73 – 0.87 g/mL (AS-D-5002)
<b>(n) Solubility:</b>	Negligible
<b>(o) Partition coefficient:</b>	N/A
<b>(p) Auto-ignition temperature:</b>	500 °F
<b>(q) Decomposition temperature:</b>	N/A
<b>(r) Viscosity:</b>	N/A
<b>(s) Specific Gravity:</b>	0.73 – 0.87 (AS-D-5002)

Specific testing method used to determine the property is specified in the parenthesis.

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**SECTION 10: STABILITY AND REACTIVITY**

**(a) Reactivity:** Saturated aliphatic hydrocarbons, the major components of CRUDE OIL, are incompatible with strong oxidizing agents such as nitric acid. Charring may occur followed by ignition of the material and nearby combustibles. In other settings, mostly unreactive. Not affected by aqueous solutions of acids, alkalis, most oxidizing agents, and most reducing agents. When heated sufficiently or when ignited in the presence of air oxygen, will burn exothermically to produce carbon dioxide and water.

**(b) Chemical stability:** Material is stable under normal conditions.

**(c) Possibility of hazardous reactions:** Hazardous polymerization will not occur.

**(d) Conditions to avoid (e.g., static discharge, shock, or vibration):** Excess heat, open flames, sparks, static discharge, smoking, ignition sources, and incompatible materials.

**(e) Incompatible materials:** Strong oxidizing agents, strong acids and alkalis.

**(f) Hazardous decomposition products:** carbon dioxide, carbon monoxide, smoke (non-combusted hydrocarbons). Hydrogen sulfide and oxides of nitrogen and sulfur may also be formed.

**(g) Hazardous Polymerization:** Will not occur.

**SECTION 11: TOXICOLOGICAL INFORMATION****(a) Information on likely routes of exposure:**

- **Inhalation:** causes irritation of upper respiratory tract; central nervous system stimulation followed by depression of varying degrees ranging from dizziness, headache, and incoordination to anesthesia, coma, and respiratory arrest; irregular heartbeat is dangerous complication.
- **Accidental Ingestion:** causes irritation of mucous membranes of throat, esophagus, and stomach; stimulation followed by depression of central nervous system; irregular heartbeat.
- **Skin contact:** May cause skin irritation with prolonged or repeated contact.
- **Eye contact:** May cause moderate irritation.

**(b) Symptoms related to physical, chemical and toxicological characteristics:** Skin contact may cause dermal irritation. Excessive inhalational exposures may cause irritation to nose, throat, lungs, and respiratory tract. Central nervous system effects may include headache, dizziness, loss of balance and coordination, unconsciousness, and respiratory failure. High concentrations of hydrogen sulfide can be toxic. Hydrogen sulfide acts as a chemical asphyxiant by paralyzing the respiratory center.

**(c) Delayed and immediate effects and also chronic effects from short- and long-term exposure:**

Chronic skin exposures can lead to dermatitis. Laboratory animal studies of crude oil by the dermal and inhalation exposure routes through prolonged or repeated exposure have demonstrated toxicity to the liver, blood, spleen and thymus.

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(d) Numerical measures of toxicity:

Acute Toxicity (Oral)			
Chemical	Tested % Weight	Model	LD <sub>50</sub> Range (mg/kg bw)
<b>C<sub>1</sub> – C<sub>3</sub></b>	No data available		
<b>n-Butane</b>	No data available		
<b>Pentanes</b>	100	Rat	> 2,000 mg/kg
<b>n-Hexane</b>	100	Mouse	5,000 mg/kg
	100	Rat	28,710 mg/kg
<b>C<sub>6</sub>-C<sub>8</sub> Aliphatic Hydrocarbons (minus n-hexane)</b>	100	Rat	>5,000 - > 15,000 mg/kg
<b>C<sub>&gt;8</sub>-C<sub>16</sub> Aliphatic Hydrocarbons</b>	100	Mouse	>5,000 – 15,800 mg/kg
<b>C<sub>19</sub> – C<sub>32</sub> Aliphatic Hydrocarbons</b>	100	Rat	> 5,000 mg/kg
<b>Benzene</b>	100	Mouse	4,700 mg/kg
	100	Rat	3,306 mg/kg
<b>Ethylbenzene</b>	100	Rat	3,500 – 5,460 mg/kg
<b>Toluene</b>	100	Rat	1,640 – 7,500 mg/kg
<b>Xylenes</b>	100	Rat	3,523 – 8,600 mg/kg
<b>C<sub>9</sub> – C<sub>16</sub> Aromatic Hydrocarbons</b>	No data available		
<b>C<sub>17</sub> – C<sub>32</sub> Aromatic Hydrocarbons</b>	100	Rat	2,700 mg/kg
<b>Hydrogen Sulfide</b>	70%	Rat	100 -215 mg/kg

Acute Toxicity (Dermal)			
Chemical	% Weight	Model	LD <sub>50</sub> Range (mg/kg bw)
<b>C<sub>1</sub> – C<sub>3</sub></b>	No data available		
<b>Butane</b>	No data available		
<b>Pentanes</b>	100	Rabbit	3,000 mg/kg
<b>n-Hexane</b>	100	Rabbit	3,000 mg/kg
<b>C<sub>6</sub>-C<sub>8</sub> Aliphatic Hydrocarbons (minus n-hexane)</b>	100	Rabbit	> 2,920 - > 3,160 mg/kg
<b>C<sub>&gt;8</sub>-C<sub>16</sub> Aliphatic Hydrocarbons</b>	100	Rabbits & rats	> 2,000 mg/kg
<b>C<sub>19</sub> – C<sub>32</sub> Aliphatic Hydrocarbons</b>	100	Rat	> 2,000 mg/kg
<b>Benzene</b>	100	Rabbit	8,260 mg/kg
<b>Ethylbenzene</b>	100	Rabbit	17,800 mg/kg
<b>Toluene</b>	100	Rabbit	12,124 mg/kg
<b>Xylene</b>	100	Rabbit	43,000 mg/kg
<b>C<sub>9</sub> – C<sub>16</sub> Aromatic Hydrocarbons</b>	No data available		
<b>C<sub>17</sub> – C<sub>32</sub> Aromatic Hydrocarbons</b>	Data not sufficient for classification		
<b>Hydrogen sulfide</b>	No data available		

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Acute Toxicity (Inhalation)		
Chemical	Model	LC <sub>50</sub> Range (mg/L)
C <sub>1</sub> – C <sub>3</sub>	Rat	>1,464 mg/L/15 min
n-Butane	Rat	658 mg/L
Pentanes	Rat	> 18 mg/L
n-Hexane	Rat	169 mg/L
C <sub>6</sub> -C <sub>8</sub> Aliphatic Hydrocarbons (minus n-hexane)	Rat	> 23 to > 33 mg/L
C <sub>&gt;8</sub> -C <sub>16</sub> Aliphatic Hydrocarbons	Rat	24 mg/L
C <sub>19</sub> – C <sub>32</sub> Aliphatic Hydrocarbons	Rat	> 5,000 mg/L
Benzene	Rat	31.9 mg/L
Ethylbenzene	No data available	
Toluene	Rat	>20 mg/L
Xylene	Rat	27.57 mg/L
C <sub>9</sub> – C <sub>16</sub> Aromatic Hydrocarbons	No data available	
C <sub>17</sub> – C <sub>32</sub> Aromatic Hydrocarbons	Data not sufficient for classification	
Hydrogen Sulfide	Rat	380 – 1,500 mg/m <sup>3</sup>

**Skin Corrosion and/or Irritation:****Serious eye damage and/or eye irritation:****Respiratory Sensitization:****Skin Sensitization:****Germ cell mutagenicity:****Reproductive Toxicity:****Specific Target Organ Toxicity (Single Exposure):****Specific Target Organ Toxicity (Repeated Exposure):****Aspiration hazard:****(e) Carcinogenicity:**

Prolonged skin contact may cause mild to moderate irritation

Direct contact with the eyes may cause minimal to moderate eye irritation.

No data available.

No evidence of skin sensitization

Some components (benzene) may cause chromosomal aberrations

Some evidence of reproductive toxicity for some components (C<sub>1</sub> – C<sub>3</sub>, toluene).

Not classified; some evidence of CNS effects, e.g. drowsiness and dizziness, by some components.

May cause effects on the central nervous system, hematological system, liver and kidney through prolonged or repeated exposures.

May cause pneumonitis upon swallowing as aspiration into the lung. May be fatal.

### Carcinogenicity

Compound	ACGIH	IARC	NTP	OSHA
C <sub>1</sub> – C <sub>3</sub>	Not classified	Not classified	Not listed	Not classified
Butane	Not classified	Not classified	Not listed	Not classified
Pentanes	Not classified	Not classified	Not listed	Not classified
n-Hexane	Not classified	Not classified	Not listed	Not classified
C <sub>6</sub> -C <sub>8</sub> Aliphatic Hydrocarbons (minus n-hexane)	Not classified	Not classified	Not listed	Not classified

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Carcinogenicity				
Compound	ACGIH	IARC	NTP	OSHA
<b>C<sub>&gt;8</sub>-C<sub>16</sub> Aliphatic Hydrocarbons</b>	Not classified	Not classified	Not listed	Not classified
<b>C<sub>19</sub> – C<sub>32</sub> Aliphatic Hydrocarbons</b>	Not classified	Not classified	Not listed	Not classified
<b>Benzene</b>	A1 – Confirmed Human Carcinogen	Group 1 – Carcinogenic to Humans	Known to be a human carcinogen	Carcinogen
<b>Ethylbenzene</b>	A3; Confirmed animal carcinogen with unknown relevance to humans.	Group 2B: Possibly carcinogenic to humans	Not listed	Not classified
<b>Toluene</b>	A4; Not classifiable as a human carcinogen.	Group 3 - Not classifiable as to its carcinogenicity to humans	Not listed	Not classified
<b>Xylene</b>	A4; Not classifiable as a human carcinogen.	Group 3 - Not classifiable as to its carcinogenicity to humans	Not listed	Not classified
<b>C<sub>9</sub> – C<sub>16</sub> Aromatic Hydrocarbons</b>	Not classified	Not classified	Not listed	Not classified
<b>C<sub>17</sub> – C<sub>32</sub> Aromatic Hydrocarbons</b>	Not classified	Not classified	Not listed	Not classified
<b>Hydrogen sulfide</b>	Not classified	Not classified	Not listed	Not classified

### SECTION 12: ECOLOGICAL INFORMATION

**(a) Ecotoxicity:** This material is expected to be potentially toxic to aquatic organisms. Ecotoxicity data have not been determined specifically for this mixture. A range of measurements of aquatic toxicity has been obtained in laboratory studies of crude oils with LC<sub>50</sub> or EC<sub>50</sub> values in the range of 1 to 100 mg/L. The values are generally consistent with the predicted aquatic toxicity of this mixture based on the hydrocarbon composition. Acute toxicity could potentially fall within the range of 1 – 10 mg/L, depending on the proportion of low molecular weight hydrocarbons in the crude's composition (EPA, 2011).

**(b) Persistence and degradability:** Crude oil is not considered readily biodegradable and most nonvolatile components are not biodegradable. Some components are persistent in water. Lighter components will tend to evaporate but the heavier components may become dispersed in water or absorbed to soil or sediment.

**(c) Bioaccumulative potential:** The octanol water coefficient (Log K<sub>ow</sub>) values for the hydrocarbon components of this material range from less than 2 to greater than 6, and therefore would be regarded as having the potential to bioaccumulate.

**(d) Mobility in soil:** Some components may be mobile and contaminate groundwater.

**(e) Other adverse effects:** Coating with this mixture can kill birds, plankton, aquatic life, algae, and fish.

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### SECTION 13: DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL:** It is the responsibility of the user to determine if disposal material is hazardous according to federal, state and local regulations. Dispose waste in accordance with the federal, state, and local laws and regulations. This material is listed as a RCRA hazardous waste under 40 CFR 261-271. The product can be an ignitable hazardous waste.

Containers should be completely used and emptied prior to discarding. Residues from containers can possibly be considered to be hazardous wastes.

EPA Waste Number:

D001-Ignitability Characteristic

DO18-Toxicity Characteristic (Benzene)

### SECTION 14: TRANSPORT INFORMATION

U.S. Department of Transportation (DOT)

SHIPPING NAME:	Petroleum Crude Oil	IATA HAZARD CLASS:	3
DOT HAZARD CLASS:	3	IMDG CLASS:	3
DOT SHIPPING ID:	UN1267	RID/ADR CODES:	
PACKING GROUP:	I	PACKING GROUP:	I
LABEL:	Flammable Liquid/1267	HAZARD ID:	Flammable liquid



**Reportable quantity:** 2100.8 lbs / 953.78 kg [311.76 gal / 1180.1 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.

Canada Transportation of Dangerous Goods (TDG)

Proper Shipping Name: UN1267, Petroleum Crude Oil, 3, PG I

Class: 3 UN Number: UN1267 Packing Group: I

\*As indicated in Section 9, analytical chemical data for this product are consistent with a Packing Group II designation; however, due to the potentially variable response of crude oil to various testing methods, Packing Group I is recommended as a more protective designation.

### SECTION 15: REGULATORY INFORMATION

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200

#### CERCLA/SARA-Section 302

This material may contain hydrogen sulfide which is subject to the reporting requirements of SARA 302 and 40 CFR 372: TPQ – 500 lb; EPCRA RQ – 100 lb.

#### CERCLA/SARA-Section 311/312 (Title III Hazard Categories)

Acute Health	Yes
Chronic Health	Yes
Fire Hazard	Yes
Pressure Hazard	No

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Reactive Hazard      No

**US EPCRA (SARA Title III) Section 313-Toxic Chemical: De minimis concentration**

Component	De minimis
Benzene	0.1%
Toluene	1.0%
Ethylbenzene	0.1%
Xylenes	1.0%
n-Hexane	1.0%
Naphthalene	0.1%

**CERCLA (Superfund) reportable quantity (lbs.)**

EPA's Petroleum Exclusion applies to this material - (CERCLA 101(14))

**California Proposition 65:** Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5): ethyl benzene, benzene, naphthalene, toluene, polycyclic aromatic hydrocarbons.

**Component Analysis - State**

Component	CAS	CA	MA	MN	NJ	PA	RI
Xylenes (o-, m-, p- isomers)	1330-20-7	Yes	Yes	Yes	Yes	Yes	Yes
Toluene	108-88-3	Yes	Yes	Yes	Yes	Yes	Yes
Hydrogen sulfide	7783-06-4	Yes	Yes	Yes	Yes	Yes	Yes
Ethylbenzene	100-41-4	Yes	Yes	Yes	Yes	Yes	Yes
Benzene	71-43-2	Yes	Yes	Yes	Yes	Yes	Yes

**National Chemical Inventories:**

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA.

All components are either on the DSL, or are exempt from DSL listing requirements.

**U.S. Export Control Classification Number: EAR99**

EPA CWA &amp; OPA

This product is classified as an 'oil' under Section 311 of the Clean Water Act (CWA) and Oil Pollution Act of 1990 (OPA), subject to spill reporting requirements.

**Canada (DSL)**

The components of this product are in compliance with the chemical notification requirements of the NSN Regulations under CEPA, 1999.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

**Workplace Hazardous Materials Information System (WHMIS) Hazard Class**



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B2 - Flammable Liquid

D1A - Material Causing Immediate and Serious Toxic Effects --- Very Toxic Material

D2A - Material Causing Other Toxic Effects Very Toxic

D2B - Material Causing Other Toxic Effects --- Toxic Material


**Component Analysis - WHMIS IDL**

The following component is identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Benzene	71-43-2	0.1 %
Toluene	108-88-3	1 %
Ethylbenzene	100-41-4	0.1 %
Hydrogen sulfide	7783-06-4	1 %

**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.

Europe inventory: All components are listed or exempted.

**SECTION 16: OTHER INFORMATION**

This Safety Data Sheet is authored pursuant to the OSHA Hazard Communication/HazCom 2012 Final Rule.

**COMMON TERMS AND ACRONYMS:**

<b>ACGIH:</b>	American Conference of Governmental Industrial Hygienists
<b>C:</b>	Ceiling Limit
<b>CAS#:</b>	Chemical Abstracts System Number
<b>CERCLA:</b>	Comprehensive Environmental Response, Compensation, and Liability Act
<b>CNS:</b>	Central Nervous System
<b>DOT:</b>	Department of Transportation
<b>DSL:</b>	Domestic Substance List
<b>EC<sub>50</sub>:</b>	Effective concentration that inhibits the endpoint to 50% of control population
<b>EINECS:</b>	European List of Notified Chemical Substances
<b>EPA:</b>	U.S. Environmental Protection Agency
<b>ESIS:</b>	European Chemical Substances Information System
<b>HMIS:</b>	Hazardous Materials Identification System
<b>IARC:</b>	International Agency for Research on Cancer

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<b>IDLH:</b>	Immediately Dangerous to Life and Health
<b>IATA:</b>	International Air Transport Association
<b>IMDG:</b>	International Maritime Dangerous Goods
<b>LC<sub>50</sub>:</b>	Concentration of air resulting in death to 50% of experimental animals
<b>LD<sub>50</sub>:</b>	Administered dose resulting in death to 50% of experimental animals
<b>LEL:</b>	Lower Explosive Limit
<b>MSHA:</b>	Mine Safety and Health Administration
<b>NFPA:</b>	National Fire Protection Association
<b>NIOSH:</b>	National Institute for Occupational Safety and Health
<b>N/A:</b>	Not Available
<b>N/C:</b>	Not Classified
<b>N/D:</b>	No data sufficient for classification
<b>NE:</b>	Not Established
<b>NOAEC:</b>	No Observed Adverse Effect Concentration
<b>NTP:</b>	National Toxicology Program
<b>OECD:</b>	Organization for Economic Co-operation and Development
<b>OSHA:</b>	Occupational Safety and Health Administration
<b>PEL:</b>	Permissible Exposure Limit
<b>PPE :</b>	Personal Protective Equipment
<b>RCRA:</b>	Resource Conservation and Recovery Act
<b>SARA:</b>	Superfund Amendments and Reauthorization Act
<b>SCBA:</b>	Self-Contained Breathing Apparatus
<b>STEL:</b>	Short Term Exposure Limit
<b>STP:</b>	Standard Temperature and Pressure
<b>TLV:</b>	Threshold Limit Value
<b>TSCA:</b>	Toxic Substances Control Act
<b>TWA:</b>	Time Weighted Average
<b>UEL:</b>	Upper Explosive Limit
<b>WHMIS:</b>	Workplace Hazardous Materials Information System

**Disclaimer:**

The information presented herein has been compiled from sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief, but it is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgement.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

Date of SDS Revisions:	Version 1.1 - 5/24/18 (EHS&R) Version 1.2 - 09/24/2019 (HSER)
Date of SDS Preparation:	5/27/2015
SDS Prepared by:	Center for Toxicology and Environmental Health, LLC.