Crude Oil

SECTION 1. IDENTIFICATION

Product Identifier	Crude Oil
Other Means of Identification	CREW ENERGY INC
Other Identification	11-33-048-27W3
Product Family	Oil
Manufacturer	CREW ENERGY INC, SUITE 800 250-5TH ST SW, CALGARY, AB, T2P0R4
Emergency Phone No.	Crew Energy 24 Hour Emergency Phone Number, 1-866-384-6240 (24/7), Heavy Oil 24 Hour Emergency Number: 1-780-872-5432, CANUTEC 24 Hour Emergency Number: 613-996-6666
SDS No.	0414
Date of Preparation	December 02, 2016

SECTION 2. HAZARD IDENTIFICATION

Classified according to Canada's Hazardous Products Regulations (WHMIS 2015) and the US Hazard Communication Standard (HCS 2012).

Classification

Flammable liquid - Category 2; Acute toxicity (Oral) - Category 4

Label Elements

Signal Word:
Danger
Hazard Statement(s):
H225 Highly flammable liquid and vapour.
H302 Harmful if swallowed.
H333 May be harmful if inhaled.
Precautionary Statement(s):
Prevention:
P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P241 Use explosion-proof electrical, ventilating, and lighting equipment.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
Response:
P301 + P312 IF SWALLOWED: Call a POISON CENTRE or doctor if you feel unwell.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.
Disposal:

P501 Dispose of contents and container in accordance with local, regional, national and international regulations.

Other Hazards

Hazardous to the environment. Marine pollutant. Harmful to animal life. Harmful to plants. Contains volatile organic compounds. Persistent, bioaccumulative and toxic (PBT) substance.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers
Petroleum	8002-05-9	60-100	
n-Hexane	110-54-3	1-5	
Xylene (mixed isomers)	1330-20-7	0.5-1.5	
Methylcyclohexane	108-87-2	0.5-1.5	
n-Butane	106-97-8	0.1-1	
ISOPENTANE	78-78-4	0.1-1	
n-Pentane	109-66-0	0.1-1	
Toluene	108-88-3	0.1-1	
Ethylbenzene	100-41-4	0.1-1	
1,2,4-Trimethylbenzene	95-63-6	0.1-1	
Cyclopentane	287-92-3	0.1-1	
Methylcyclopentane	96-37-7	0.1-1	
Cyclohexane	110-82-7	0.1-1	
Hydrogen sulfide	7783-06-4	<0.1	
Propane	74-98-6	<0.1	
Isobutane	75-28-5	<0.1	
Benzene	71-43-2	<0.1	

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). If experiencing respiratory symptoms (e.g. coughing, shortness of breath, wheezing), call a Poison Centre or doctor.

Skin Contact

Avoid direct contact. Wear chemical protective clothing if necessary. Take off contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 15-20 minutes.

Eye Contact

Rinse the contaminated eye(s) with lukewarm, gently flowing water for 5 minutes, while holding the eyelid(s) open. If eye irritation persists, get medical advice or attention.

Ingestion

Never give anything by mouth if person is rapidly losing consciousness, or is unconscious or convulsing. Do not induce vomiting. Avoid mouth-to-mouth contact by using a barrier device. Immediately call a Poison Centre or doctor.

First-aid Comments

Get medical advice or attention if you feel unwell or are concerned.

Most Important Symptoms and Effects, Acute and Delayed

If inhaled: symptoms may include coughing, shortness of breath, difficult breathing and tightness in the chest. If

swallowed: symptoms may include nausea, vomiting, stomach cramps and diarrhea.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog.

Specific Hazards Arising from the Product

Can ignite if strongly heated.

Special Protective Equipment and Precautions for Fire-fighters

Use extreme caution. Evacuate area. Fight fire from a protected, explosion-resistant location or maximum distance possible.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Increase ventilation to area or move leaking container to a well-ventilated and secure area. Eliminate all ignition sources. Use grounded, explosion-proof equipment.

Environmental Precautions

If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas. Do not allow into any sewer, on the ground or into any waterway.

Methods and Materials for Containment and Cleaning Up

Review Section 7 (Handling) of this safety data sheet before proceeding with clean-up. Stop or reduce leak if safe to do so. Cover the spill surface with the appropriate type of foam to reduce the release of vapour. Place used absorbent into suitable, covered, labelled containers for disposal. Review Section 13 (Disposal Considerations) of this safety data sheet. Contact emergency services and manufacturer/supplier for advice.

Other Information

Contact supplier, local fire and emergency services for help. Report spills to local health, safety and environmental authorities, as required.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

It is good practice to: avoid breathing product; avoid skin and eye contact and wash hands after handling. Avoid generating vapours or mists. Immediately report leaks, spills or failures of the safety equipment (e.g. ventilation system). See Section 13 (Disposal Considerations) of this safety data sheet.

Conditions for Safe Storage

Store in an area that is: cool, temperature-controlled, well-ventilated, an approved, fire-resistant area, separate from incompatible materials (see Section 10: Stability and Reactivity). Comply with all applicable health and safety regulations, fire and building codes.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

	ACGIH TLV®		OSHA PEL		AIHA WEEL	
Chemical Name	**TWA**	**STEL**	**TWA**	**Ceiling**	**8-hr TWA**	**TWA**
Petroleum			2000 mg/m3			
Hydrogen sulfide	1 ppm	15 ppm	10 ppm			
Propane			1000 ppm			
Isobutane		1000 ppm				

n-Butane		1000 ppm	800 ppm			
ISOPENTANE	1000 ppm	750 ppm	600 ppm			
n-Pentane	1000 ppm	750 ppm	600			
n-Hexane	50 ppm		50 ppm			
Benzene	0.5 ppm	5 ppm	1 ppm			
Toluene	20 ppm	150 ppm	200 ppm			
Xylene (mixed isomers)	100 ppm	150 ppm	100 ppm	150 ppm		
1,2,4-Trimethylbenzene	25 ppm	25 ppm				
Cyclopentane	600					
Cyclohexane	100 ppm					
Methylcyclohexane	400 ppm		400 ppm			

Appropriate Engineering Controls

Do not allow product to accumulate in the air in work or storage areas, or in confined spaces. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

Individual Protection Measures

Eye/Face Protection

Not required but it is good practice to wear safety glasses or chemical safety goggles.

Skin Protection

In case of an emergency (e.g. an uncontrolled release): wear chemical protective clothing e.g. gloves, aprons, boots.

Respiratory Protection

Wear a NIOSH approved air-purifying respirator with an organic vapour cartridge.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Dark brown.
Initial Boiling Point/Range	183.2 ºC (361.8 ºF)
Flash Point	68.5 ºC (155.3 ºF) (closed cup)
Relative Density (water = 1)	0.9825 at 15 ºC
Viscosity	4699.96 mm2/s at 25 ºC (kinematic)

Other Information

Physical State	Liquid
Other Physical Property 1	RVP @ 37.8C = <0.1kPa

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

Reacts in the presence of friction, heat, high energy sources (e.g. welding arcs), increased temperature.

Conditions to Avoid

Open flames, sparks, static discharge, heat and other ignition sources.

Incompatible Materials

Increased risk of fire and explosion on contact with: strong oxidizing agents (e.g. perchloric acid).

Hazardous Decomposition Products

None.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation; skin contact; skin absorption; eye contact; ingestion.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Petroleum	Not available	> 5000 mg/kg (rat)	> 2000 mg/kg (rabbit)
Hydrogen sulfide	~ 444 ppm (rat) (4-hour exposure) (gas)	Not available	Not available
Propane	80000 ppm (rat)	Not available	Not available
Isobutane	> 13023 ppm (rat) (4-hour exposure) (vapour)	Not available	Not available
n-Butane	~ 658 mg/L (rat) (4-hour exposure) (vapour)	Not available	Not available
ISOPENTANE	~ 140,000 mg/L (mouse) (2-hour exposure)	Not available	Not available
n-Pentane	> 6000 ppm (rat) (4-hour exposure)	> 2000 mg/kg (rat)	Not available
n-Hexane	~ 73680 ppm (rat) (4-hour exposure)	15820 mg/kg (male rat)	3295 mg/kg (rabbit)
Benzene	13200 ppm (mouse) (4-hour exposure)	930 mg/kg (rat)	8240 mg/kg (rabbit)
Toluene	28.1 mg/L (rat) (4-hour exposure)	5580 mg/kg (male rat)	12125 mg/kg (rabbit)
Ethylbenzene	Not available	Not available	Not available
Xylene (mixed isomers)	5000 ppm (male rat) (4-hour exposure)	2119 mg/kg (mouse)	> 1700 mg/kg (rabbit)
1,2,4-Trimethylbenzene	~ 3670 ppm (rat) (4-hour exposure)	3400 mg/kg (rat)	Not available
Cyclopentane	~ 110 mg/L (mouse)	Not available	Not available
Methylcyclopentane	95000-120000 mg/m3 (mouse)	5000-15000 mg/kg (rat)	Not available
Cyclohexane	~ 9500 ppm (rat) (4-hour exposure)	~ 30400 mg/kg (rat)	> 2000 mg/kg (rabbit)
Methylcyclohexane	~ 7350 ppm (mouse) (4-hour exposure)	~ 2250 ppm (mouse)	> 86700 ppm (rabbit)

Skin Corrosion/Irritation

Not a skin irritant.

Serious Eye Damage/Irritation

Human experience and animal tests show no or very mild irritation.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

Symptoms may include headache, nausea, dizziness, drowsiness and confusion.

Skin Absorption

Symptoms may include redness, rash, swelling and itching.

Ingestion

Harmful based on human experience.

Aspiration Hazard

Symptoms may include coughing, choking, shortness of breath, difficult or rapid breathing, and wheezing.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

No information was located.

Respiratory and/or Skin Sensitization

May cause severe asthma-like symptoms (respiratory sensitization) based on information for closely related chemicals.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Petroleum	Group 1	A2	Not Listed	Not Listed
Hydrogen sulfide	Not Listed	Not Listed	Not Listed	Not Listed
Propane	Not Listed	Not Listed	Not Listed	Not Listed
Isobutane	Not Listed	Not designated	Not Listed	Not Listed
n-Butane	Not Listed	Not designated	Not Listed	Not Listed
ISOPENTANE	Not Listed	Not Listed	Not Listed	Not Listed
n-Hexane	Not Listed	Not designated	Not Listed	Not Listed
Benzene	Group 1	A1	Known carcinogen	Listed
Toluene	Group 3	A4	Not Listed	Not Listed
Xylene (mixed isomers)	Group 3	A4	Not Listed	Not Listed
1,2,4-Trimethylbenzene	Not Listed	Not designated	Not Listed	Not Listed
Cyclopentane	Not Listed	Not designated	Not Listed	Not Listed
Methylcyclopentane	Not Listed	Not designated	Not Listed	Not Listed
Cyclohexane	Not Listed	Not designated	Not Listed	Not Listed
Methylcyclohexane	Not Listed	Not designated	Not Listed	Not Listed

May cause cancer.

Key to Abbreviations

A1 = Confirmed human carcinogen. A3 = Animal carcinogen. Group 1 = Carcinogenic to humans.

Reproductive Toxicity

Development of Offspring

Animal studies show effects on the offspring. Studies in people show effects on the unborn child.

Sexual Function and Fertility

Conclusions cannot be drawn from the limited studies available.

Effects on or via Lactation

Conclusions cannot be drawn from the limited studies available.

Germ Cell Mutagenicity

May be mutagenic based on limited evidence.

Interactive Effects

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxic to aquatic life, terrestrial life, amphibians, birds, soil organisms, soil microorganisms, microorganisms.

Acute Aquatic Toxicity

Chemical Name	LC50 Fish	EC50 Crustacea	ErC50 Aquatic Plants	ErC50 Algae
Petroleum	258 mg/L (Oncorhynchus mykiss (rainbow trout); 48-hour; fresh water; static)	Not available	Not available	Not available
Hydrogen sulfide	Not available	Not available	Not available	Not available
Propane	Not available	Not available	Not available	Not available
Isobutane	Not available	Not available	Not available	Not available
n-Butane	Not available	Not available	Not available	Not available
ISOPENTANE	~ 3.1 mg/L (Oncorhynchus mykiss (rainbow trout); 96-hour; fresh water; static)	Not available	Not available	Not available
n-Pentane	Not available	Not available	Not available	Not available
n-Hexane	~ 4 mg/L (fresh water; static)	30-66 (Daphnia magna (water flea))	Not available	Not available
Benzene	Not available	Not available	Not available	Not available
Toluene	34.27 mg/L (Pimephales promelas (fathead minnow); 96-hour)	Not available	Not available	Not available
Ethylbenzene	Not available	Not available	Not available	Not available
Xylene (mixed isomers)	Not available	Not available	Not available	Not available
1,2,4-Trimethylbenzene	~ 7.72 mg/L (Pimephales promelas (fathead minnow); 96-hour; fresh water)	~ 30 mg/L (Daphnia magna (water flea); 48-hour; fresh water)	Not available	Not available
Cyclopentane	Not available	~ 280 mg/L (Daphnia magna (water flea); 48-hour; salt water; static)	Not available	Not available
Methylcyclopentane	Not available	Not available	Not available	Not available
Cyclohexane	~ 93 mg/L (Pimephales promelas (fathead minnow); 48-hour; fresh water; static)	5-9 mg/L (Daphnia magna (water flea); 48-hour; fresh water; static)	Not available	Not available
Methylcyclohexane	~ 72 mg/L (96-hour; fresh water; static)	Not available	Not available	Not available

Chronic Aquatic Toxicity

Chemical Name	NOEC Fish	EC50 Fish	NOEC Crustacea	EC50 Crustacea
Petroleum	Not available	Not available	Not available	Not available
Hydrogen sulfide	Not available	Not available	Not available	Not available
Propane	Not available	Not available	Not available	Not applicable
Isobutane	Not available	Not available	Not available	Not available

n-Butane	Not available	Not available	Not available	Not available
ISOPENTANE	Not available	Not available	Not available	Not available
n-Pentane	Not available	Not available	Not available	Not available
n-Hexane	Not available	Not available	Not available	Not available
Benzene	Not available	Not available	Not available	Not available
Toluene	Not available	Not available	Not available	Not available
Ethylbenzene	Not available	Not available	Not available	Not available
Xylene (mixed isomers)	Not available	Not available	Not available	Not available
1,2,4-Trimethylbenzene	Not available	Not available	Not available	Not available
Cyclopentane	Not available	Not available	Not available	Not available
Methylcyclopentane	Not available	Not available	Not available	Not available
Cyclohexane	Not available	Not available	Not available	Not available
Methylcyclohexane	Not available	Not available	Not available	Not available

Persistence and Degradability

Predicted not to degrade rapidly based on quantitative structure-activity relationships.

Bioaccumulative Potential

This product or its degradation products are expected to bioaccumulate and may pass through the food chain.

Mobility in Soil

If released into the environment, this product can move slowly through the soil.

Other Adverse Effects

This product contains volatile organic compounds. This product contains endocrine disruptors.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Contact local environmental authorities for approved disposal or recycling methods in your jurisdiction. Store product for disposal as described under Storage in Section 7 of this safety data sheet. Treat waste in an approved waste disposal facility.

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	1267	Petroleum Crude Oil	CLASS 3	III
US DOT	1267	Petroleum Crude Oil	CLASS 3	III

Special Precautions Not applicable

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

Proof of Dangerous Goods Classification

Date of Classification November 15, 2016
Technical Name PETROLEUM CRUDE OIL
Classification FLAMMABLE LIQUID
Classification Method LABORATORY REPORT

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

Canada

WHMIS 1988 Classification

Class B2

Class D2A; D2B

B2 - Flammable Liquid; D2A - Very Toxic (Chronic toxicity; Carcinogenicity); D2B - Toxic (Skin irritant; Eye irritant; Skin sensitization; Mutagenicity)

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

All ingredients are listed on the DSL/NDSL.

CEPA - National Pollutant Release Inventory (NPRI)

Part 1A, Part 5.

USA

Toxic Substances Control Act (TSCA) Section 8(b)

All ingredients are listed on the TSCA Inventory.

Additional USA Regulatory Lists

(Petroleum). (Methylcyclohexane). (Methylcyclopentane). (Cyclopentane). (Cyclohexane). (1,2, 4-Trimethylbenzene). (Toluene). (Ethylbenzene). (Xylene (mixed isomers)). (Benzene). (n-Hexane). (n-Pentane). (ISOPENTANE). (n-Butane). (Propane) SARA Title III - Section 302: SARA Title III - Section 304: CERCLA: SARA Title III - Section 313: Not Listed. (Hydrogen sulfide) SARA Title III - Section 302: 500 SARA Title III - Section 304: 100 CERCLA: 100 SARA Title III - Section 313: 313s.

SECTION 16. OTHER INFORMATION

SDS Prepared By	AGAT Laboratories Ltd
Phone No.	(403)299-2000
Date of Preparation	December 02, 2016
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists AIHA® = AIHA® Guideline Foundation. HSDB® = Hazardous Substances Data Bank IARC = International Agency for Research on Cancer NFPA = National Fire Prevention Association NIOSH = National Institute for Occupational Safety and Health NTP = National Toxicology Program OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). HSDB® database. US National Library of Medicine. Available from Canadian Centre for Occupational Health and Safety (CCOHS). NIOSH Pocket Guide database. National Institute for Occupational Safety and Health. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA (“BIOVIA”). Available from Canadian Centre for Occupational Health and Safety (CCOHS). CONCAWE - Hazard classification and labeling of petroleum substances in the European Economic Area - 2012 tDG Canada uS DOT uN Model Regulation.
Disclaimer	The information contained herein is based on the information available at the indicated date of preparation but no warranty expressed or implied, is made. Further, the information contained herein relates only to this product or material and may not be valid when used in combination with any other product or material in any process. If the product is not to be used for a purpose or under condition that are normal or reasonably foreseeable, this information cannot be relied upon as complete or applicable. For greater certainty of information, specific uses of the product must be reviewed with the supplier.