

1. IDENTIFICATION

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|-----------------------------------|--------------------------------------------------------------------------------------|
| Product Name: | Produced Salt Water, Sweet |
| Synonyms: | Produced Brine; Produced Water. |
| SDS Number: | 778932 |
| Product Use: | Waterflood for enhanced oil recovery (EOR). |
| Restrictions on Use: | Not available. |
| | |
| Manufacturer/ Supplier | CENOVUS ENERGY INC. 500 Centre Street SE, PO Box 766 Calgary, AB T2P 0M5 |
| Prepared By | Cenovus Energy Inc. Health and Safety |
| Phone Number | 1-403-766-2000 |
| Emergency Telephone | Cenovus 1-877-458-8080 CANUTEC 1-613-996-6666 (Canada) CHEMTREC 1-800-424-9300 |

2. HAZARDS IDENTIFICATION

GHS INFORMATION

Classification: Not hazardous according to OSHA criteria (29 CFR 1910.1200).
 Not hazardous according to WHMIS 2015 criteria.

LABEL ELEMENTS

Hazard None.
Pictogram(s):
Signal Word: None.
Hazard Statements: Not applicable.

Precautionary Statements

Prevention: Not applicable.
Response: Not applicable.
Storage: Not applicable.
Disposal: Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients with Unknown Toxicity: None.

Toxicity:
 This material is not considered hazardous by the OSHA Hazard Communication Standard, (29 CFR 1910.1200).

This material is not considered hazardous by the Hazardous Products Regulations, 2015.

3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredient(s) | Common name / Synonyms | CAS No. | % wt./wt. |
|------------------------|------------------------|-----------|-----------|
| Water | Not available. | 7732-18-5 | 90 - 95 |
| Sodium chloride (NaCl) | Sodium chloride | 7647-14-5 | 5 - 10 |
| Petroleum | Not available. | 8002-05-9 | < 0.1 |

4. FIRST AID MEASURES

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| Inhalation: | <p>If inhaled: Call a poison center or doctor if you feel unwell.</p> <p>Acute and delayed symptoms and effects: May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.</p> |
| Eye Contact: | <p>If in eyes: Rinse cautiously with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a poison center or doctor if you feel unwell.</p> <p>Acute and delayed symptoms and effects: May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.</p> |
| Skin Contact: | <p>If on skin: Wash with plenty of water. Call a poison center or doctor if you feel unwell.</p> <p>Acute and delayed symptoms and effects: May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.</p> |
| Ingestion: | <p>If swallowed: Call a poison center or doctor if you feel unwell. If vomiting occurs naturally, have victim lean forward to reduce the risk of aspiration. Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.</p> <p>Acute and delayed symptoms and effects: May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.</p> |
| General Advice: | In case of accident or if you feel unwell, seek medical advice immediately (show the label or SDS where possible). |
| Note to Physicians: | Symptoms may not appear immediately. |

5. FIRE FIGHTING MEASURES

FLAMMABILITY AND EXPLOSION INFORMATION

Not flammable or combustible by OSHA/WHMIS criteria. The trace hydrocarbon may burn if product is involved in a fire.

Sensitivity to Mechanical Impact: This material is not sensitive to mechanical impact.

Sensitivity to Static Discharge: This material is not sensitive to static discharge.

MEANS OF EXTINCTION

Suitable Extinguishing Media: Small Fire: Dry chemical, CO2, water spray or regular foam.

Large Fire: Water spray, fog or regular foam. Move containers from fire area if you can do it without risk.

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| Unsuitable Extinguishing Media: | Not available. |
| Products of Combustion: | Oxides of carbon. Aldehydes. Sodium oxide. Chlorine. |
| Protection of Firefighters: | Fire may produce irritating, corrosive and/or toxic gases. Runoff from fire control or dilution water may cause pollution. Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters' protective clothing will only provide limited protection. |

6. ACCIDENTAL RELEASE MEASURES

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| Emergency Procedures: | Keep unauthorized personnel away. Stay upwind. Keep out of low areas. Ventilate closed spaces before entering. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). |
| Personal Precautions: | Do not touch or walk through spilled material. Use personal protection recommended in Section 8. |
| Environmental Precautions: | Keep out of drains, sewers, ditches, and waterways. |
| Methods for Containment: | Stop leak if without risk. Do not flush to sewer or allow to enter waterways. |
| Methods for Clean-Up: | Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. |
| Other Information: | See Section 13 for disposal considerations. |

7. HANDLING AND STORAGE

Handling:

Do not swallow. See Section 8 for information on Personal Protective Equipment.

Storage:

Store away from incompatible materials. See Section 10 for information on Incompatible Materials. Keep out of the reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines Component

Water [CAS No. 7732-18-5]

ACGIH: No TLV established.

OSHA: No PEL established.

Sodium chloride [CAS No. 7647-14-5]

ACGIH: No TLV established.

OSHA: No PEL established.

Petroleum [CAS No. 8002-05-9]

ACGIH: No TLV established.

OSHA: 500 ppm (TWA), 2000 mg/m³ (TWA);
400 ppm (TWA) [Vacated];

PEL: Permissible Exposure Limit

TLV: Threshold Limit Value

TWA: Time-Weighted Average

Engineering Controls: Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapour, gas, etc.) below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT (PPE)



Eye/Face Protection: Wear safety glasses. Use equipment for eye protection that meets the standards referenced by CSA Standard CAN/CSA-Z94.3-92 and OSHA regulations in 29 CFR 1910.133 for Personal Protective Equipment.

Hand Protection: Wear protective gloves. Consult manufacturer specifications for further information.

Skin and Body Protection: Wear protective clothing.

Respiratory Protection: If engineering controls and ventilation are not sufficient to control exposure to below the allowable limits then an appropriate NIOSH/MSHA approved air-purifying respirator that meets the requirements of CSA Standard CAN/CSA- Z94.4-11, or self-contained breathing apparatus must be used. Supplied air breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.

General Hygiene Considerations: Handle according to established industrial hygiene and safety practices. Consult a competent industrial hygienist to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

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|----------------------------------------|------------------------------------------|
| Appearance: | Colourless to grey to dark brown liquid. |
| Colour: | Colourless to grey to dark brown. |
| Odour: | Odourless to slight hydrocarbon. |
| Odour Threshold: | Not available. |
| Physical State: | Liquid. |
| pH: | 6.9 |
| Melting Point / Freezing Point: | 0 °C (32 °F) (Water) |
| Initial Boiling Point: | Not available. |
| Boiling Range: | 100 °C (212 °F) (Water) |
| Flash Point: | Not available. |

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|------------------------------------------------|----------------------------------|
| Evaporation Rate: | 0.36 (n-BuAc = 1) |
| Flammability (solid, gas): | Not applicable. |
| Lower Flammability Limit: | Not available. |
| Upper Flammability Limit: | Not available. |
| Vapor Pressure: | 13.6 mmHg at 20 °C (68 °F) |
| Vapor Density: | < 1 (Air = 1) |
| Relative Density: | 1.1 (Water = 1) at 20 °C (68 °F) |
| Solubilities: | Soluble in water. |
| Partition Coefficient: n-Octanol/Water: | Not available. |
| Auto-ignition Temperature: | Not available. |
| Decomposition Temperature: | Not available. |
| Viscosity: | Not available. |
| Percent Volatile, wt. %: | Not available. |
| VOC content, wt. %: | Not available. |
| Density: | Not available. |
| Coefficient of Water/Oil Distribution: | Not available. |

10. STABILITY AND REACTIVITY

| | |
|--------------------------------------------|-----------------------------------------------------------------------------|
| Reactivity: | Contact with incompatible materials. Sources of ignition. Exposure to heat. |
| Chemical Stability: | Stable under normal storage conditions. |
| Possibility of Hazardous Reactions: | None known. |
| Conditions to Avoid: | Contact with incompatible materials. Sources of ignition. Exposure to heat. |
| Incompatible Materials: | Not available. |
| Hazardous Decomposition Products: | Not available. |

11. TOXICOLOGICAL INFORMATION

EFFECTS OF ACUTE EXPOSURE

Product Toxicity

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|--------------------|----------------|
| Oral: | Not available. |
| Dermal: | Not available. |
| Inhalation: | Not available. |

Component Toxicity

| Component | CAS No. | LD50 oral | LD50 dermal | LC50 |
|-----------------|-----------|------------------|------------------------|-------------------------------------|
| Water | 7732-18-5 | > 90 mL/kg (rat) | Not available. | Not available. |
| Sodium chloride | 7647-14-5 | 3000 mg/kg (rat) | > 10000 mg/kg (rabbit) | > 42000 mg/m ³ (rat); 1H |
| Petroleum | 8002-05-9 | 4300 mg/kg (rat) | Not available. | Not available. |

Likely Routes of Exposure: Eye contact. Skin contact. Inhalation. Ingestion. Skin absorption.

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system.

Symptoms (including delayed and immediate effects)

Inhalation: May cause respiratory irritation. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Eye: May cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Skin: May cause skin irritation. Signs/symptoms may include localized redness, swelling, and itching.

Ingestion: May cause gastrointestinal irritation. Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Skin Sensitization: Not available.

Respiratory Sensitization: Not available.

Medical Conditions

Aggravated By Exposure: Not available.

EFFECTS OF CHRONIC EXPOSURE (from short and long-term exposure)

Target Organs: Skin. Eyes. Gastrointestinal tract. Respiratory system. Blood. Bone marrow. Liver. Reproductive system. Central nervous system.

Chronic Effects: Prolonged or repeated contact may dry skin and cause irritation. Repeated dermal application of crude oils in rats produced systemic toxicity in blood, liver, thymus and bone marrow.

Carcinogenicity: Product is not classified as a carcinogen. See Component Carcinogenicity table below for information on individual components. Lifetime skin painting studies in animals with whole crude oils and crude oil fractions have produced tumours in animals following prolonged and repeated skin contact.

Component Carcinogenicity

| Component | ACGIH | IARC | NTP | OSHA | Prop 65 |
|-----------|-------------|---------|-------------|------------------|-------------|
| Petroleum | Not listed. | Group 3 | Not listed. | OSHA Carcinogen. | Not listed. |

Mutagenicity: Not available.

Reproductive Effects: Studies exist which report a link to crude oil and reproductive effects including menstrual disorders.

Developmental Effects

Teratogenicity: Not available.

Embryotoxicity: Repeated dermal application of crude oils to pregnant rats produced maternal toxicity and fetal developmental toxicity and fetal tumours.

Toxicologically Synergistic Materials: Not available.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available.

Persistence / Degradability: Not available.

Bioaccumulation / Accumulation: Not available.

Mobility in Environment: Not available.

Other Adverse Effects: Not available.

13. DISPOSAL CONSIDERATIONS

Disposal Instructions: Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT)

Proper Shipping Name: Not regulated.

Class: Not applicable.

UN Number: Not applicable.

Packing Group: Not applicable.

Label Code: Not applicable.

Canada Transportation of Dangerous Goods (TDG)

If transported in a clean container: not regulated.

If transported in a container that last carried petroleum crude oil or condensate: note the classification of residue.

15. REGULATORY INFORMATION

Chemical Inventories

US (TSCA)

Section 15: REGULATORY INFORMATION

The components of this product are in compliance with the chemical notification requirements of TSCA.

Canada (DSL)

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

Federal Regulations

United States

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SARA Title III

No components are listed.

State Regulations

Massachusetts

US Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

| Component | CAS No. | RTK List |
|-----------|-----------|----------|
| Petroleum | 8002-05-9 | Listed. |

New Jersey

US New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

| Component | CAS No. | RTK List |
|-----------|-----------|----------|
| Petroleum | 8002-05-9 | SHHS |

Note: SHHS = Special Health Hazard Substance

Pennsylvania

US Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

| Component | CAS No. | RTK List |
|-----------|-----------|----------|
| Petroleum | 8002-05-9 | Listed. |

California

California Prop 65: This product does not contain chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

16. OTHER INFORMATION

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| Date of Preparation of SDS: | May 15, 2017 |
| Previous Issue Date: | November 6, 2015 |
| Version: | 2.0 |