PRODUCED WATER

SECTION 1 – PRODUCT IDENTIFICATION

PRODUCT NAME:	PRODUCED WATER		
SYNONYMS:	PRODUCTION WATER FORMATION WATER	SALTWATER	SALTWATER BRINE
PRODUCT MANUFACTURER / DISTRIBUTOR:		DISCOVERY NATURAL RESOURCES 1001 17TH ST., STE. 2000 DENVER, CO 80202	Phone Number: (303) 893-5073
RECOMMENDED USE:	BENEFICIAL REUSE IN HYDRAULIC FRACTURING, WASTE		CAS #: MIXTURE
EMERGENCY PHONE NUMBERS:	(325) 835-3465	DISCOVERY 24/7 OPERATIONS CENTER	REVISION DATE: 10/1/24

SECTION 2 – HAZARDS IDENTIFICATION

Classification:

Flammable Liquid Hazard	Category 3
Skin Irritation	Category 3
Eye Irritation	Category 2B
Carcinogenicity	Category 1B
Respiratory Irritation	Category 3
Reproductive Toxicity	Category 2

GHS Label Elements:

GHS02 GHS07 GHS08

Signal Word: WARNING!

Emergency Overview: WARNING! Flammable liquid. Keep away from heat/sparks/open flame. Wear protective gloves and eye/face protection. Breathing the mist may be irritating to the respiratory tract. May cause temporary eye and skin irritation. Product may contain a small number of hydrocarbons with a trace amount of benzene which may cause cancer and heritable genetic damage.

Hazard Statements H226 - Flammable liquid and vapor

Precautionary Statements

P210 - Keep away from heat, hot surfaces, open flames, sparks – No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical, lighting, ventilating equipment.
P242 - Use only non-sparking tools.
P243 - Take precautionary measures against static discharge.
P280 - Wear eye protection, protective clothing, protective gloves.
P303+P361+P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370+P378 - In case of fire: Use dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2) for extinction.
P403+P235 - Store in a well-ventilated place. Keep cool.
P501 - Dispose of contents/container according to local, regional, national, and international regulations.

OSHA Regulatory Status: This product is hazardous according to OSHA 29CFR 1910.1200

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	CONCENTRATION*
Water	7732-18-5	80-95%
Calcium chloride	10043-52-4	0-20%
Potassium chloride	7447-40-7	0-20%
Sodium chloride	7647-14-5	0-20%
Benzene	71-43-2	0.1-1%
Petroleum hydrocarbons	8002-05-9	<1%

*MAY CONTAIN SMALL AMOUNTS OF CONDENSATE OR CRUDE OIL AS A CONTAMINANT. ALL CONCENTRATIONS ARE IN PERCENT BY WEIGHT UNLESS INGREDIENT IS A GAS. GAS CONCENTRATIONS ARE IN PERCENT BY VOLUME.

SECTION 4 – FIRST AID MEASURES

Inhalation: If symptomatic, move to fresh air. Seek medical attention if symptoms persist.

Skin Contact: Remove contaminated clothing and shoes. Wash skin with soap and water. Seek medical attention if symptoms, such as redness or irritation, occur.

Eye Contact: Any materials that contact the eye should be washed out immediately with water. If easy to do so, remove contact lenses. Hold eyelids open to ensure thorough flushing. Flush for a minimum of 15 minutes and seek medical attention if redness, pain, or irritation occurs.

Ingestion: First aid is normally not required. However, if greater than ½ liter (pint) ingested, seek medical attention. Do not give fluid or induce vomiting. Never give anything by mouth to an unconscious person.

Most important symptoms and health effects, both acute and delayed:

Symptoms/Injuries:	Contains a small amount of Hydrogen Sulfide, symptoms of overexposure are headaches, dizziness, nausea, coughing, respiratory irritation, eye irritation, skin irritation, pain in the nose, and loss of consciousness. Heating of the product may release higher amounts of Hydrogen Sulfide (H2S).
Symptoms/Injuries after Inhalation:	This product is considered to be non-toxic by inhalation. Inhalation of high concentrations may cause central nervous system depression such as dizziness, drowsiness, headache, and similar narcotic symptoms, but no long-term effects. Numbness, a "chilly" feeling, and vomiting have been reported from accidental exposures to high concentrations.
Symptoms/Injuries after Skin Contact:	Absorbed through the skin. May cause mild skin irritation.
Symptoms/Injuries after Eye Contact:	May cause eye irritation.
Symptoms/Injuries after Ingestion:	Ingestion is likely to be harmful or have adverse effects.
Chronic Symptoms:	Prolonged exposure may cause effects in organs such as the liver, kidneys, blood, and nervous system.

SECTION 5 – FIREFIGHTING MEASURES

The bulk of the product is water and will not ignite. However, sufficient hydrocarbon and hydrocarbon vapor may be present on the surface of the liquid and/or in the headspace of a tank to cause a flash fire.

Suitable Extinguishing Media:	Extinguish with foam, dry powder, water fog or carbon dioxide.
Unsuitable Extinguishing Media:	Water should not be used directly on burning liquid. Water should be used to cool adjacent tanks and vessels.
Special Fire Fighting Procedures:	Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Fight fire from upwind direction whenever possible. If safe to do so, cut off supply and allow the flame to burn out.
Hazardous Combustion Products:	Carbon oxides

SECTION6 – ACCIDENTAL RELEASE MEASURES

Personal Precautions:	Keep away from sources of ignition, no smoking. Stay upwind and keep unnecessary personnel away. Wear protective clothing as described in Section 8 of this datasheet **For Non-Emergency Personnel:** *Protective Equipment:* Use appropriate personal protection equipment (PPE). *Emergency Procedures:* Evacuate unnecessary personnel. **For Emergency Responders:** *Protective Equipment:* Use recommended respiratory protection. *Emergency Procedures:* If possible, stop the flow of product. Eliminate ignition sources.
Environmental Precautions:	Prevent further leakage or spillage if safe to do so. Do not allow to enter drains, sewers, or waterways.
Methods for Containment	Stop the flow of material if safe to do so. Dike spilled material with non-combustible material like vermiculite, sand or earth to prevent entry into a drain, sewer, or waterway.
Methods for Cleaning Up:	Recover free liquid by pumping with an explosion-proof pump or hand pump. Soak up the product using dirt, sand, vermiculite or other appropriate absorbent and place into a container for later disposal.
Other Information:	Ensure work area is adequately ventilated and avoid excess skin contact with the spilled material.

SECTION 7 – HANDLING AND STORAGE

Handling:	Handle as a flammable liquid. Tank headspaces should always be regarded as potentially flammable and care should be taken to avoid static electrical discharge and all ignition sources during filling, discharging and sampling from storage tanks. Bond and ground containers during product transfer to reduce the possibility of static-initiated fire or explosion. Keep away from heat, sparks, and open flame. Electrical equipment should be approved for the classified area. Wear appropriate personal protective equipment (see section 8). Smoking, eating or drinking should be prohibited when working with the equipment. Workers should wash thoroughly with soap and water and discard contaminated clothing after entering or handling the equipment. Workers should wash hands and face before eating, drinking and smoking.
Storage:	Keep containers in a well-ventilated area away from the flame, sparks, excessive temperatures and open flames. Keep the containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Do not enter storage areas and confined spaces without adequate ventilation. Use appropriate respiratory protection if there is the potential to exceed the exposure limit(s). Vapors containing benzene may accumulate during storage and transport.

SECTION 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	Source	Type	Exposure Limits	Notes
Cyclohexane	ACGIH	TWA	300 ppm	
Cyclohexane	OSHA	PEL	300 ppm	
Hexane	ACGIH	TWA	50 ppm	
Hexane	OSHA	PEL	500 ppm	
Benzene	ACGIH	STEL	2.5 ppm	
		TWA	0.5 ppm	
Benzene	OSHA	STEL	5 ppm	
		PEL	1 ppm	
Toluene	ACGIH	TWA	50ppm	
Toluene	OSHA	Ceiling	500 ppm	
		STEL	300 ppm	
		PEL	200 ppm	
Ethylbenzene	ACGIH	STEL	125 ppm	
		TWA	100 ppm	
Ethylbenzene	OSHA	PEL	100 ppm	
Xylene	ACGIH	TWA	100ppm	
		STEL	150ppm	
Xylene	OSHA	TWA	100 ppm	

Engineering Controls:	Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits.
Respiratory Protection:	If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. If respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998.
Respirator type:	Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister. Contact health and safety professional or manufacturer for specific information.
Eye Protection: Risk of contact:	Wear approved safety goggles.
Hand Protection:	It is a good industrial hygiene practice to minimize skin contact. If skin contact cannot be avoided nitrile gloves should be worn. If dermal contact is expected for a prolonged period of time gloves should be upgraded to Viton.
Skin Protection:	Normal working clothing should be worn. Wash contaminated clothing prior to rescue or after use.
Hygiene Measures:	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.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Property	Characteristic
Color:	Brown to yellow
Odor:	Faint hydrocarbon
Physical State:	Liquid
pH:	4.9-8.5
Melting Point:	Not available
Freezing Point:	<0° (32°F)
Boiling Point:	100°C (212°F) (Approximate)
Flash Point:	> 73 °F (> 23 °C)
Flammability (Solid):	Not applicable
Flammability Limit – Upper (%)	Not applicable
Flammability Limit – Lower (%)	Not applicable
Evaporation Rate:	No date available
Vapor Pressure:	13.6 mmHg @20°C
Vapor Density (Air=1)	<1
Specific Gravity	>1 (4°C)
Solubility in Water:	Soluble
Solubility (Other):	No Data Available
Partition Coefficient (n-Octanol/water):	No Data Available
Autoignition Temperature:	No Data Available
Viscosity:	No Data Available
Explosive Properties:	No Data Available

SECTION 10 – STABILITY AND REACTIVITY

Stability: Stable under the prescribed storage conditions

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

Incompatible Materials: Strong oxidizing agents.

Hazardous Decomposition Products: Carbon dioxide, impartial combustion may generate carbon monoxide.

SECTION 11 – TOXICOLOGICAL INFORMATION

Components

Chemical Name	Test Results
Calcium chloride (10043-52-4)	Acute Oral LD50 Rat: 1000 mg/kg
	Acute Other LD50 Mouse: 42 mg/kg
Potassium Chloride (7447-40-7)	Acute Oral LD50 Rat: 2600 mg/kg
Benzene (71-43-2)	Acute Inhalation LC50 Mouse: 9980 mg/l
	Acute Inhalation LC50 Rat: 10000 mg/l 7 Hours
	Acute Oral LD50 Mouse: 4700 mg/kg
	Acute Oral LD50 Rat: 3306 mg/kg
	Acute Other LD50 Mouse: 340 mg/kg
	Acute Other LD50 Mouse: 0.000001 ml/kg
	Acute Other LD50 Rat: 2.89 mg/kg
Petroleum	Acute Oral LD50 > (Rat): 4300 mg/kg

Exposure is most likely via inhalation of vapors or dermal contact. Symptoms of exposure may include skin irritation, irritation of eyes, nose, and throat, dizziness, and drowsiness. Contact with eyes may cause severe irritation.

SECTION 12 – ECOLOGICAL INFORMATION

Components

Chemical Name	Test Results
Calcium chloride (10043-52-4)	EC50 Water flea (Daphnia magna): 52 mg/l 48 hours
	LC50 Fathead minnow (Pimephales promelas): 3930 – 5360 mg/l 96 hours
Potassium chloride (7447-40-7)	EC50 Water flea (Daphnia magna): 83 mg/l 48 hours
	LC50 Western mosquitofish (Gambusia affinis): 435 mg/l 96 hours
Sodium chloride (7647-14-5)	EC50 Water flea (Daphnia magna): 340.7 - 469.2 mg/l 48 hours
	LC50 American eel (Anguilla rostrata): 0 - 27260 mg/l 96 hours
Benzene (71-43-2)	EC50 Water flea (Daphnia magna): 8.76 - 15.6 mg/l 48 hours
	EC50 Water flea (Daphnia Magna): 8.76 - 15.6 mg/l 48 Hours
	LC50 Rainbow trout, Donaldson trout (Oncorhynchus mykiss): 5 mg/l 96 Hours

Mobility: No data available.
Persistence and Degradability: No data available.
Bioaccumulation Potential: No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

General Information: This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b) (4)).Dispose of waste and residues in accordance with local authority requirements.

Disposal Methods: No specific disposal method required. Since emptied containers retain product residue, follow label warnings even after container is emptied.

SECTION 14 – TRANSPORT INFORMATION

DOT: Not regulated.
TDG: Not regulated.
IATA: Not regulated.
IMDG: Not regulated.

SECTION 15 – REGULATORY INFORMATION

WHMIS Classification: This is not a WHMIS controlled product.
This product or all components are listed or exempt from listing on the following inventory: TSCA

US Federal Regulations
CERCLA Hazardous Substance List (40 CFR 302.4): Not regulated.

SARA Title III
Section 302 Extremely Hazardous Substances (40 CFR 355, Appendix A): Not regulated.
Section 311/312 (40 CFR 370):
X Acute (Immediate) Chronic (Delayed) Fire Reactive Pressure Generating
Section 313 Toxic Release Inventory (40 CFR 372): Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130):
Not regulated.

Clean Water Act Section 311 Hazardous Substances (40 CFR 117.3): Not regulated.

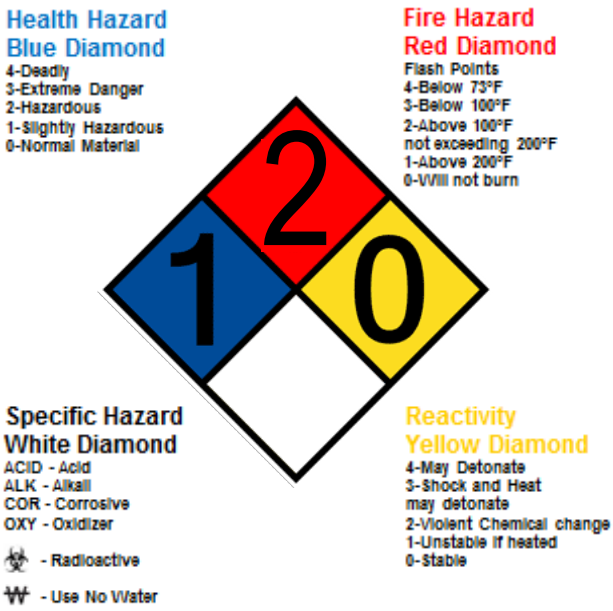
Drug Enforcement Act: Not regulated.

TSCA
TSCA Section 4(a) Final Test Rules & Testing Consent Orders: Not regulated.
TSCA Section 5(a)(2) Final Significant New Use Rules (SNURs) (40CFR 721, Subpt. E): Not regulated.
TSCA Section 5(e) PMN-Substance Consent Orders: Not regulated.
TSCA Section 12(b) Export Notification (40 CFR 707, Subpart. D): Not regulated.

State Regulations
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): Not regulated.
Massachusetts Right-To-Know List: Petroleum
Michigan Critical Materials List (Michigan Natural Resources and Environmental Protection Act (Act. 451 of 1994)):
Not regulated.
Minnesota Hazardous Substances List: Petroleum

New Jersey Right-To-Know List: Petroleum
Pennsylvania Right-To-Know List: Petroleum
Rhode Island Right-To-Know List: Petroleum

SECTION 16- OTHER INFORMATION



HAZARD RATINGS

	Health Hazard	Fire Hazard	Instability	Special Hazard
NFPA	1	2	0	NONE

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
NFPA Label colored diamond code: Blue - Health; Red - Flammability; Yellow - Instability; White - Special Hazards

	Health Hazard	Flammability	Physical Hazard	Personal Protection
HMIS	1	2	0	--

Hazard rating: 0 - Minimal; 1 - Slight; 2 - Moderate; 3 - Serious; 4 - Severe
HMIS Label colored barcode: Blue - Health; Red - Flammability; Orange - Physical Hazards; White – Special

Disclaimer: This information is provided without warranty. The information is believed to be correct.
This information should be used to make an independent determination of the methods to safeguard workers and the environment.