

## 1. Identification

<b>Product identifier</b>	<b>Produced Water</b>	
<b>Other means of identification</b>	Not available.	
<b>Recommended use</b>	Natural Gas Production Liquids	
<b>Recommended restrictions</b>	None known.	
<b>Manufacturer/Importer/Supplier/Distributor information</b>		
<b>Company name</b>	Noble Energy, Inc.	
<b>Address</b>	1001 Noble Energy Way Houston, TX 77070 US US	
<b>Telephone</b>	Non-emergency Telephone:	720-587-2085
<b>E-mail</b>	SDSGLOBAL@nobleenergyinc.com	
<b>Emergency phone number</b>	24 Hour Emergency: Access code	1-760-476-3962 333053

## 2. Hazard(s) identification

<b>Physical hazards</b>	Not classified.	
<b>Health hazards</b>	Serious eye damage/eye irritation	Category 2B
	Germ cell mutagenicity	Category 1B
	Carcinogenicity	Category 1A
<b>OSHA defined hazards</b>	Not classified.	

**Label elements**



<b>Signal word</b>	Danger	
<b>Hazard statement</b>	Causes eye irritation. May cause genetic defects. May cause cancer.	
<b>Precautionary statement</b>		
<b>Prevention</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection. Wash thoroughly after handling.	
<b>Response</b>	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If exposed or concerned: Get medical advice/attention.	
<b>Storage</b>	Store in a well-ventilated place. Keep cool. Store locked up.	
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.	
<b>Hazard(s) not otherwise classified (HNOC)</b>	None known.	

## 3. Composition/information on ingredients

**Mixtures**

Chemical name	CAS number	%
Water	7732-18-5	90
Calcium chloride	10043-52-4	< 10
Potassium Chloride	7447-40-7	< 10

Sodium Chloride	7647-14-5	< 10
Benzene	71-43-2	< 1
Petroleum Distillate	8002-05-9	< 1

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

#### 4. First-aid measures

<b>Inhalation</b>	If symptomatic, move to fresh air. Get medical attention if symptoms persist.
<b>Skin contact</b>	Wash skin with soap and water. Get medical attention promptly if symptoms occur after washing.
<b>Eye contact</b>	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.
<b>Ingestion</b>	Seek medical advice.
<b>Most important symptoms/effects, acute and delayed</b>	Causes eye irritation. Prolonged or repeated skin contact may cause irritation. May cause cancer. May cause genetic defects.
<b>Indication of immediate medical attention and special treatment needed</b>	Treat symptomatically.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

#### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Use any media suitable for the surrounding fires.
<b>Unsuitable extinguishing media</b>	None known.
<b>Specific hazards arising from the chemical</b>	None known.
<b>Special protective equipment and precautions for firefighters</b>	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

#### 6. Accidental release measures

<b>Personal precautions, protective equipment and emergency procedures</b>	Wear appropriate personal protective equipment (See Section 8).
<b>Methods and materials for containment and cleaning up</b>	Absorb spill with vermiculite or other inert material, then place in a container for chemical waste for proper disposal.  Large Spills: Flush with plenty of water. Prevent runoff from entering drains, sewers, or streams. Dike for later disposal.
<b>Environmental precautions</b>	Avoid discharge into drains, water courses or onto the ground.

#### 7. Handling and storage

<b>Precautions for safe handling</b>	Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Use only with adequate ventilation.
<b>Conditions for safe storage, including any incompatibilities</b>	Keep containers tightly closed. Store away from incompatible materials.

#### 8. Exposure controls/personal protection

##### Occupational exposure limits

##### US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	5 ppm
	TWA	1 ppm

##### US. OSHA Table Z-2 (29 CFR 1910.1000)

Components	Type	Value
Benzene (CAS 71-43-2)	Ceiling	25 ppm

**US. OSHA Table Z-2 (29 CFR 1910.1000)**

Components	Type	Value
	TWA	10 ppm

**US. ACGIH Threshold Limit Values**

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	2.5 ppm
	TWA	0.5 ppm

**US. NIOSH: Pocket Guide to Chemical Hazards**

Components	Type	Value
Benzene (CAS 71-43-2)	STEL	1 ppm
	TWA	0.1 ppm
Petroleum Distillate (CAS 8002-05-9)	Ceiling	1800 mg/m <sup>3</sup>
	TWA	350 mg/m <sup>3</sup>

**Biological limit values****ACGIH Biological Exposure Indices**

Components	Value	Determinant	Specimen	Sampling Time
Benzene (CAS 71-43-2)	25 µg/g	S-Phenylmercapturic acid	Creatinine in urine	*
	25 µg/g	S-Phenyl-mercapturic acid		*

\* - For sampling details, please see the source document.

**Exposure guidelines****US - California OELs: Skin designation**

Benzene (CAS 71-43-2) Can be absorbed through the skin.

**US ACGIH Threshold Limit Values: Skin designation**

Benzene (CAS 71-43-2) Can be absorbed through the skin.

**Appropriate engineering controls** Ensure adequate ventilation, especially in confined areas. Provide easy access to water supply and eye wash facilities.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection** Wear safety glasses with side shields (or goggles).

**Skin protection**

**Hand protection** Chemical resistant gloves are recommended.

**Other** Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information.

**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. Respirator type: Air-purifying respirator with an appropriate, government approved (where applicable), air-purifying filter, cartridge or canister.

**Thermal hazards** Not applicable.

**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.

**9. Physical and chemical properties**

<b>Appearance</b>	Clear or opaque liquid.
<b>Physical state</b>	Liquid.
<b>Form</b>	Liquid.
<b>Color</b>	Clear.
<b>Odor</b>	Salty to slightly hydrocarbon.

<b>Odor threshold</b>	Not relevant.
<b>pH</b>	6.5 - 8
<b>Melting point/freezing point</b>	33.8 °F (1 °C)
<b>Initial boiling point and boiling range</b>	212 °F (100 °C)
<b>Flash point</b>	Not relevant.
<b>Evaporation rate</b>	< 1 (n-Butylacetate=1)
<b>Flammability (solid, gas)</b>	Not relevant.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	Not relevant.
<b>Flammability limit - upper (%)</b>	Not relevant.
<b>Vapor pressure</b>	17.5 mm Hg @ 70°F (21°C)
<b>Vapor density</b>	> 1 @ 68°F (20°C) (Air=1)
<b>Relative density</b>	1.018 - 1.02 @ 68°F (20°C)
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Completely soluble
<b>Partition coefficient (n-octanol/water)</b>	3.6
<b>Auto-ignition temperature</b>	Not relevant.
<b>Decomposition temperature</b>	Not relevant.
<b>Viscosity</b>	1 mPa·s
<b>Viscosity temperature</b>	100.04 °F (37.8 °C)
<b>Other information</b>	Solubility complete except for possible crude component.
<b>Bulk density</b>	8.33 lb/gal

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.
<b>Conditions to avoid</b>	None known.
<b>Incompatible materials</b>	Strong oxidizing agents.
<b>Hazardous decomposition products</b>	No hazardous decomposition products are known.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Ingestion</b>	No adverse effects due to ingestion are expected.
<b>Inhalation</b>	Under normal conditions of intended use, this material is not expected to be an inhalation hazard.
<b>Skin contact</b>	May be irritating to the skin.
<b>Eye contact</b>	Causes eye irritation.

**Symptoms related to the physical, chemical and toxicological characteristics** Causes eye irritation. Prolonged or repeated skin contact may cause irritation.

### Information on toxicological effects

#### Acute toxicity

Components	Species	Test Results
Benzene (CAS 71-43-2)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Mouse	9980 ppm
		9980 ppm, 7 Hours
	Rat	43767 mg/m <sup>3</sup> , 4 Hours
		13700 ppm, 4 Hours
		10000 ppm, 7 Hours
<i>Oral</i>		
LD50	Mouse	4700 mg/kg
	Rat	3306 mg/kg
Calcium chloride (CAS 10043-52-4)		
<b>Acute</b>		
<i>Oral</i>		
LD50	Rat	1000 mg/kg
<i>Other</i>		
LD50	Mouse	42 mg/kg
<b>Skin corrosion/irritation</b>	Prolonged or repeated skin contact may cause irritation.	
<b>Serious eye damage/eye irritation</b>	Causes eye irritation.	
<b>Respiratory or skin sensitization</b>		
<b>Respiratory sensitization</b>	Not a respiratory sensitizer.	
<b>Skin sensitization</b>	Not a skin sensitizer.	
<b>Germ cell mutagenicity</b>	May cause genetic defects.	
<b>Carcinogenicity</b>	May cause cancer.	
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>		
Benzene (CAS 71-43-2)	1 Carcinogenic to humans.	
Petroleum Distillate (CAS 8002-05-9)	3 Not classifiable as to carcinogenicity to humans.	
<b>NTP Report on Carcinogens</b>		
Benzene (CAS 71-43-2)	Known To Be Human Carcinogen.	
<b>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)</b>		
Benzene (CAS 71-43-2)	Cancer	
<b>Reproductive toxicity</b>	Not classified.	
<b>Specific target organ toxicity - single exposure</b>	Not classified.	
<b>Specific target organ toxicity - repeated exposure</b>	Not classified.	
<b>Aspiration hazard</b>	Not classified.	

## 12. Ecological information

**Ecotoxicity** The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

Components	Species	Test Results
Benzene (CAS 71-43-2)		
<b>Aquatic</b>		
Crustacea	EC50	Water flea (Daphnia magna)
		8.76 - 15.6 mg/l, 48 hours
Fish	LC50	Rainbow trout, donaldson trout (Oncorhynchus mykiss)
		5.3 mg/l, 96 hours

Components	Species	Test Results
Petroleum Distillate (CAS 8002-05-9)		
<b>Aquatic</b>		
Fish	LC50	Cutthroat trout ( <i>Oncorhynchus clarki</i> )
		2.1 - 4.3 mg/l, 96 hours
<b>Persistence and degradability</b>	Not established.	
<b>Bioaccumulative potential</b>		
<b>Partition coefficient n-octanol / water (log Kow)</b>		
Produced Water (CAS Mixture)		3.55
Benzene (CAS 71-43-2)		2.13
<b>Mobility in soil</b>	Not available.	
<b>Other adverse effects</b>	Not established.	

### 13. Disposal considerations

<b>Disposal instructions</b>	Do not discharge into drains, water courses or onto the ground. Discharge, treatment, or disposal may be subject to national, state, or local laws.
<b>Hazardous waste code</b>	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
<b>US RCRA Hazardous Waste U List: Reference</b>	
Benzene (CAS 71-43-2)	U019
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations.
<b>Contaminated packaging</b>	Since emptied containers retain product residue, follow label warnings even after container is emptied.

### 14. Transport information

<b>DOT</b>	Not regulated as dangerous goods.
<b>IATA</b>	Not regulated as dangerous goods.
<b>IMDG</b>	Not regulated as dangerous goods.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	This substance/mixture is not intended to be transported in bulk.

### 15. Regulatory information

<b>US federal regulations</b>	This product is hazardous according to OSHA 29 CFR 1910.1200.	
<b>TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)</b>		
Not regulated.		
<b>US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)</b>		
Benzene (CAS 71-43-2)	Cancer	
	Central nervous system	
	Blood	
	Aspiration	
	Skin	
	Eye	
	respiratory tract irritation	
	Flammability	
<b>CERCLA Hazardous Substance List (40 CFR 302.4)</b>		
Benzene (CAS 71-43-2)	LISTED	
<b>Superfund Amendments and Reauthorization Act of 1986 (SARA)</b>		
<b>Hazard categories</b>	Immediate Hazard - Yes	
	Delayed Hazard - Yes	
	Fire Hazard - No	
	Pressure Hazard - No	
	Reactivity Hazard - No	
<b>SARA 302 Extremely hazardous substance</b>		
Not listed.		

SARA 311/312 Hazardous chemical No

**SARA 313 (TRI reporting)**

Chemical name	CAS number	% by wt.
Benzene	71-43-2	< 1
Petroleum Distillate	8002-05-9	< 1

**Other federal regulations**

**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Benzene (CAS 71-43-2)  
Petroleum Distillate (CAS 8002-05-9)

**Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)**

Not regulated.

**Safe Drinking Water Act (SDWA)** Not regulated.

**US state regulations** WARNING: This product contains chemicals known to the State of California to cause birth defects or other reproductive harm.

**US. Massachusetts RTK - Substance List**

Benzene (CAS 71-43-2)  
Petroleum Distillate (CAS 8002-05-9)

**US. New Jersey Worker and Community Right-to-Know Act**

Benzene (CAS 71-43-2)  
Petroleum Distillate (CAS 8002-05-9)

**US. Pennsylvania Worker and Community Right-to-Know Law**

Benzene (CAS 71-43-2)  
Petroleum Distillate (CAS 8002-05-9)

**US. Rhode Island RTK**

Benzene (CAS 71-43-2)

**US. California Proposition 65**

**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

Benzene (CAS 71-43-2)

**International Inventories**

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information, including date of preparation or last revision**

Issue date	03-July-2014
Revision date	03-July-2014
Version #	03

**NFPA ratings****References**

ECHA registered substances database  
HSDB® - Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
Registry of Toxic Effects of Chemical Substances (RTECS)

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