Attachment L

Drilling Mud Additives Information
<table>
<thead>
<tr>
<th>Trade Name</th>
<th>Vendor</th>
<th>Primary Application</th>
<th>Dosage Rates (per 1,000 gallons)</th>
<th>Composition</th>
<th>Sulfate (%)</th>
<th>NSF/ANSI 60 Certified (Yes or No) *</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMC Gel</td>
<td>DCS Fluid Solutions</td>
<td>Bentonite gellant and viscosifier</td>
<td>200 to 400 lbs</td>
<td>• &gt;94% bentonite</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• &lt;0.5% acrylamide homopolymer</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• &lt;0.5 sodium carbonate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 1-6% silica crystalline - quartz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clay Breaker</td>
<td>DCS Fluid Solutions</td>
<td>Clay inhibitor and flocculent</td>
<td>5 to 15 lbs</td>
<td>• Trade Secret b</td>
<td>0%</td>
<td>Yes, for dry powder</td>
</tr>
<tr>
<td>Polymud</td>
<td>DCS Fluid Solutions</td>
<td>Clay inhibitor and viscosifier</td>
<td>3 to 4.5 quarts</td>
<td>• 30-40% mineral oil</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td>Sandmaster</td>
<td>DCS Fluid Solutions</td>
<td>Gel strength enhancer / formation stabilizer and viscosifier</td>
<td>5 to 10 lbs</td>
<td>• xanthan gum</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td>TorqBreaker</td>
<td>DCS Fluid Solutions</td>
<td>Surfactant, lubricant/torque reducer</td>
<td>0.5 to 1 gallon</td>
<td>• &lt;5.0% alkyl dimethyl ammonium chloride</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• &lt;3% ethanolamine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SealPac</td>
<td>DCS Fluid Solutions</td>
<td>Filtrate reducer and formation stabilizer</td>
<td>5 to 10 lbs</td>
<td>• 60-100% polysaccharide</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td>Barackade Bentonite</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>High yield Wyoming bentonite</td>
<td>150 to 200 lbs</td>
<td>• 1-5% Crystalline silica, quartz</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td>EZ Mud Gold</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Polymer for shale and clay control</td>
<td>10 to 20 lbs</td>
<td>• Contains no hazardous substances</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td>Power PAC L</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Wall cake enhancer, bore wall stabilizer</td>
<td>10 lbs</td>
<td>• 60-100% polysaccharide</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td>Power Swell</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Polymer for shale and clay control</td>
<td>50 to 150 lbs</td>
<td>• Contains no hazardous substances</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td>Power Thin</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Clay cutter, mud thinner</td>
<td>4 gallons</td>
<td>• Contains no hazardous substances</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td>Power XAN</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Suspension booster, hole cleaning aid</td>
<td>10 lbs</td>
<td>• 60-100% xanthan gum</td>
<td>0%</td>
<td>Yes</td>
</tr>
<tr>
<td>Star Plex</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Rheology enhancer</td>
<td>12 lbs</td>
<td>• Magnesium compound (% trade secret) b</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Sodium compound (% trade secret) b</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Aluminum compound (% trade secret) b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lubra Star Plus</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Torque/friction reducer, mud lubricant, cuttings lubricant</td>
<td>10 gallons</td>
<td>• Trade Secret b</td>
<td>0%</td>
<td>No</td>
</tr>
<tr>
<td>Magma Fiber LCM</td>
<td>Drill Mud Direct (Halliburton)</td>
<td>Fibrous sealing, plugging, seepage loss control</td>
<td>50 to 150 lbs</td>
<td>• Mineral fiber</td>
<td>0%</td>
<td>Yes</td>
</tr>
</tbody>
</table>
# Table L-1

| Trade Name               | Vendor                        | Primary Application                  | Dosage Rates (per 1,000 gallons) | Composition                                      | Sulfate (%) | NSF/ANSI 60 Certified (Yes or No) *
|--------------------------|-------------------------------|--------------------------------------|----------------------------------|--------------------------------------------------|-------------|-----------------------------
| Power Soda Ash/Soda Ash  | Drill Mud Direct (Halliburton)| Condition Water / Control pH         | 4 lbs to raise pH by 1           | • 60-100% Sodium carbonate                       | 0%          | Yes                         |
| DrilPlex HDD             | M I Swaco                     | Fluid loss control                   | 6 to 50 lbs                     | • 30 - 60% Sodium carbonate, • 1-5% Calcium hydroxide | 0%          | Yes                         |

* The NSF/ANSI 60 Standard establishes minimum health effects requirements for the chemicals, the chemical contaminants, and the impurities that are directly added to drinking water from drinking water treatment chemicals. For more information, refer to: [http://www.nsf.org/newsroom_pdf/NSF-ANSI_60_watemarked.pdf](http://www.nsf.org/newsroom_pdf/NSF-ANSI_60_watemarked.pdf).

b Enbridge’s contractors has provided a letter directly to the MPCA with drilling mud additive chemical composition information and to request that the MPCA classify the data as non-public per Minnesota Statute 7000.1300, subpart 1.

c This additive was approved by the MPCA for use on the Alberta Clipper Pipeline Project.
SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>AMC GEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other means of identification</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses

Drilling fluid compound; viscosifier.

Details of the supplier of the safety data sheet

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>AMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>216 Balcatta Rd Balcatta WA 6021 Australia</td>
</tr>
<tr>
<td>Telephone</td>
<td>+61 8 9445 4000</td>
</tr>
<tr>
<td>Fax</td>
<td>+61 8 9445 4040</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.amcmud.com">www.amcmud.com</a></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:amc@imdexlimited.com">amc@imdexlimited.com</a></td>
</tr>
</tbody>
</table>

Emergency telephone number

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency telephone numbers</td>
<td>1800 039 008 or +61 3 9573 3112, +800 2436 2255 +613 9573 3112</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL. NON-DANGEROUS GOODS. According to the WHS Regulations and the ADG Code.

<table>
<thead>
<tr>
<th>CHEMWATCH HAZARD RATINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Flammability</td>
</tr>
<tr>
<td>Toxity</td>
</tr>
<tr>
<td>Body Contact</td>
</tr>
<tr>
<td>Reactivity</td>
</tr>
<tr>
<td>Chronic</td>
</tr>
</tbody>
</table>

| Poisons Schedule | Not Applicable |
| Classification | Carcinogenicity Category 1A, Specific target organ toxicity - repeated exposure Category 1 |

Legend:

### Hazard statement(s)

<table>
<thead>
<tr>
<th>Hazard Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H350</td>
<td>May cause cancer.</td>
</tr>
<tr>
<td>H372</td>
<td>Causes damage to organs through prolonged or repeated exposure.</td>
</tr>
</tbody>
</table>

### Precautionary statement(s) Prevention

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P201</td>
<td>Obtain special instructions before use.</td>
</tr>
<tr>
<td>P260</td>
<td>Do not breathe dust/fume/gas/mist/vapours/spray.</td>
</tr>
</tbody>
</table>

### Precautionary statement(s) Response

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P308+P313</td>
<td>IF exposed or concerned: Get medical advice/attention.</td>
</tr>
<tr>
<td>P314</td>
<td>Get medical advice/attention if you feel unwell.</td>
</tr>
</tbody>
</table>

### Precautionary statement(s) Storage

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P405</td>
<td>Store locked up.</td>
</tr>
</tbody>
</table>

### Precautionary statement(s) Disposal

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P501</td>
<td>Dispose of contents/container in accordance with local regulations.</td>
</tr>
</tbody>
</table>

### SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

#### Substances

See section below for composition of Mixtures

#### Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>% [weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1302-78-9</td>
<td>&gt;94</td>
<td>bentonite</td>
</tr>
<tr>
<td>9003-05-8</td>
<td>&lt;0.5</td>
<td>acrylamide homopolymer</td>
</tr>
<tr>
<td>497-19-8</td>
<td>&lt;0.5</td>
<td>sodium carbonate</td>
</tr>
<tr>
<td>14808-60-7</td>
<td>1-6</td>
<td>silica crystalline - quartz</td>
</tr>
</tbody>
</table>

### SECTION 4 FIRST AID MEASURES

#### Description of first aid measures

<table>
<thead>
<tr>
<th>Eye Contact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If this product comes in contact with the eyes:</td>
</tr>
<tr>
<td></td>
<td>▶ Wash out immediately with fresh running water.</td>
</tr>
<tr>
<td></td>
<td>▶ Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.</td>
</tr>
<tr>
<td></td>
<td>▶ Seek medical attention without delay; if pain persists or recurs seek medical attention.</td>
</tr>
<tr>
<td></td>
<td>▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin Contact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If skin or hair contact occurs:</td>
</tr>
<tr>
<td></td>
<td>▶ Flush skin and hair with running water (and soap if available).</td>
</tr>
<tr>
<td></td>
<td>▶ Seek medical attention in event of irritation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If fumes or combustion products are inhaled remove from contaminated area.</td>
</tr>
<tr>
<td></td>
<td>▶ Lay patient down. Keep warm and rested.</td>
</tr>
<tr>
<td></td>
<td>▶ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.</td>
</tr>
<tr>
<td></td>
<td>▶ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.</td>
</tr>
<tr>
<td></td>
<td>▶ Transport to hospital, or doctor.</td>
</tr>
<tr>
<td></td>
<td>▶ If dust is inhaled, remove from contaminated area.</td>
</tr>
<tr>
<td></td>
<td>▶ Encourage patient to blow nose to ensure clear breathing passages.</td>
</tr>
</tbody>
</table>
Ingestion

- Ask patient to rinse mouth with water but to not drink water.
- Seek immediate medical attention.
- Immediately give a glass of water.
- First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

<table>
<thead>
<tr>
<th>Fire Incompatibility</th>
<th>None known.</th>
</tr>
</thead>
</table>

Advice for firefighters

Fire Fighting

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves in the event of a fire.

Fire/Explosion Hazard

- Non combustible.
- Not considered a significant fire risk, however containers may burn.

HAZCHEM

Not Applicable

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

<table>
<thead>
<tr>
<th>Minor Spills</th>
<th>Clean up waste regularly and abnormal spills immediately. Avoid breathing dust and contact with skin and eyes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Spills</td>
<td>Clear area of personnel and move upwind. Alert Fire Brigade and tell them location and nature of hazard.</td>
</tr>
</tbody>
</table>

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

<table>
<thead>
<tr>
<th>Safe handling</th>
<th>Avoid all personal contact, including inhalation. Wear protective clothing when risk of exposure occurs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other information</td>
<td>Store in original containers. Keep containers securely sealed.</td>
</tr>
</tbody>
</table>

Conditions for safe storage, including any incompatibilities

<table>
<thead>
<tr>
<th>Suitable container</th>
<th>Polyethylene or polypropylene container. Check all containers are clearly labelled and free from leaks.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage incompatibility</td>
<td>Silicas: react with hydrofluoric acid to produce silicon tetrafluoride gas react with xenon hexafluoride to produce explosive xenon trifluoride react exothermically with oxygen difluoride, and explosively with chlorine trifluoride (these halogenated materials are not commonplace industrial materials) and other fluorine-containing compounds may react with fluorine, chlorates are incompatible with strong oxidisers, manganese trioxide, chlorine trioxide, strong alkalis, metal oxides, concentrated orthophosphoric acid, vinyl acetate may react vigorously when heated with alkali carbonates.</td>
</tr>
</tbody>
</table>
SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

**OCCUPATIONAL EXPOSURE LIMITS (OEL)**

<table>
<thead>
<tr>
<th>Source</th>
<th>Ingredient</th>
<th>Material name</th>
<th>TWA</th>
<th>STEL</th>
<th>Peak</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia Exposure</td>
<td>silica crystalline - quartz</td>
<td>Silica - Crystalline</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Standards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia Exposure</td>
<td>silica crystalline - quartz</td>
<td>Quartz (respirable dust)</td>
<td>0.1 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Standards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australia Exposure</td>
<td>silica crystalline - quartz</td>
<td>Quartz (respirable dust)</td>
<td>0.1 mg/m³</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Standards</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EMERGENCY LIMITS**

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>bentonite</td>
<td>Montmorillonite</td>
<td>30 mg/m³</td>
<td>330 mg/m³</td>
<td>2,000 mg/m³</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>Sodium carbonate</td>
<td>7.6 mg/m³</td>
<td>83 mg/m³</td>
<td>500 mg/m³</td>
</tr>
<tr>
<td>silica crystalline - quartz</td>
<td>Silica, crystalline-quartz; (Silicon dioxide)</td>
<td>0.075 mg/m³</td>
<td>33 mg/m³</td>
<td>200 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>bentonite</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>acrylamide homopolymer</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>silica crystalline - quartz</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**MATERIAL DATA**

**Exposure controls**

- **Appropriate engineering controls**: Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

- **Personal protection**
  - Safety glasses with side shields
  - Chemical goggles.
  - Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants.

- **Skin protection**: See Hand protection below

- **Hands/feet protection**: The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.
  - polychloroprene.

- **Body protection**: See Other protection below

- **Other protection**: Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area. [AS/NZS ISO 6529:2006 or national equivalent] Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers must be identified with suitable labels.
  - Overalls.
  - P.V.C.

- **Thermal hazards**: Not Available
Recommended material(s)

**GLOVE SELECTION INDEX**

Glove selection is based on a modified presentation of the: "Forsberg Clothing Performance Index". The effect(s) of the following substance(s) are taken into account in the computer-generated selection:

AMC GEL

<table>
<thead>
<tr>
<th>Material</th>
<th>CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>NATURAL RUBBER</td>
<td>C</td>
</tr>
<tr>
<td>NITRILE</td>
<td>C</td>
</tr>
</tbody>
</table>

* CPI - Chemwatch Performance Index  
A: Best Selection  
B: Satisfactory; may degrade after 4 hours continuous immersion  
C: Poor to Dangerous Choice for other than short term immersion  

**NOTE:** As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -  
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as "feel" or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

**Respiratory protection**

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, ANSI Z88 or national equivalent)

If inhalation risk above the TLV exists, wear approved dust respirator. Use respirators with protection factors appropriate for the exposure level.

- Up to 5 X TLV, use valveless mask type; up to 10 X TLV, use 1/2 mask dust respirator
- Up to 50 X TLV, use full face dust respirator or demand type C air supplied respirator
- Up to 500 X TLV, use powered air-purifying dust respirator or a Type C pressure demand supplied-air respirator
- Over 500 X TLV wear full-face self-contained breathing apparatus with positive pressure mode or a combination respirator with a Type C positive pressure supplied-air full-face respirator and an auxiliary self-contained breathing apparatus operated in pressure demand or other positive pressure mode
- Respirators may be necessary when engineering and administrative controls do not adequately prevent exposures.
- The decision to use respiratory protection should be based on professional judgment that takes into account toxicity information, exposure measurement data, and frequency and likelihood of the worker's exposure - ensure users are not subject to high thermal loads which may result in heat stress or distress due to personal protective equipment (powered, positive flow, full face apparatus may be an option).
- Published occupational exposure limits, where they exist, will assist in determining the adequacy of the selected respiratory protection. These may be government mandated or vendor recommended.
- Certified respirators will be useful for protecting workers from inhalation of particulates when properly selected and fit tested as part of a complete respiratory protection program.
- Use approved positive flow mask if significant quantities of dust becomes airborne.
- Try to avoid creating dust conditions.

**SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Bentonite clay (powder) varying in colour from grey to various shades of brown, insoluble in water.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Divided Solid</td>
</tr>
<tr>
<td>Odour</td>
<td>Not Available</td>
</tr>
<tr>
<td>Partition coefficient n-octanol / water</td>
<td>Not Available</td>
</tr>
<tr>
<td>Auto-ignition temperature (°C)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not Available</td>
</tr>
<tr>
<td>Viscosity (cSt)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Molecular weight (g/mol)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Taste</td>
<td>Not Available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Surface Tension (dyn/cm or mN/m)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Volatile Component (%vol)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Gas group</td>
<td>Not Available</td>
</tr>
<tr>
<td>pH as a solution (1%)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>VOC g/L</td>
<td>Not Available</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Immiscible</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
SECTION 10 STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Reactivity</th>
<th>See section 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical stability</td>
<td>Unstable in the presence of incompatible materials.</td>
</tr>
<tr>
<td></td>
<td>Product is considered stable.</td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>See section 7</td>
</tr>
<tr>
<td>Conditions to avoid</td>
<td>See section 7</td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>See section 7</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>See section 5</td>
</tr>
</tbody>
</table>

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

**Inhaled**
Inhalation of dusts, generated by the material during the course of normal handling, may be damaging to the health of the individual. Effects on lungs are significantly enhanced in the presence of respirable particles. Overexposure to respirable dust may produce wheezing, coughing and breathing difficulties leading to or symptomatic of impaired respiratory function.

**Ingestion**
The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.

**Skin Contact**
The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Open cuts, abraded or irritated skin should not be exposed to this material.

**Eye**
Although the material is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may cause transient discomfort characterised by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.

**Chronic**
On the basis of epidemiological data, the material is regarded as carcinogenic to humans. There is sufficient data to establish a causal association between human exposure to the material and the development of cancer. Toxic: danger of serious damage to health by prolonged exposure through inhalation.

The health hazards associated with bentonite, kaolin, and common clay, which are commercially important clay products, as well as the related phyllosilicate minerals montmorillonite, kaolinite, and illite, have an extensive literature. Fibrous clay minerals, such as sepiolite, attapulgite, and zeolites, have a separate literature.

Chronic symptoms produced by crystalline silicas included decreased vital lung capacity and chest infections. Lengthy exposure may cause silicosis a disabling form of pneumoconiosis which may lead to fibrosis, a scarring of the lining of the air sacs in the lung. Overexposure to respirable dust may cause coughing, wheezing, difficulty in breathing and impaired lung function. Chronic symptoms may include decreased vital lung capacity, chest infections Repeated exposures, in an occupational setting, to high levels of fine- divided dusts may produce a condition known as pneumoconiosis which is the lodgement of any inhaled dusts in the lung irrespective of the effect.

---

<table>
<thead>
<tr>
<th>AMC GEL</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>bentonite</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermal (rat) LD50: &gt;2000 mg/kg&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td>Not Available</td>
<td></td>
</tr>
<tr>
<td>Inhalation (rat) LC50: &gt;50 mg/l/1 h&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral (rat) LD50: &gt;2000 mg/kg&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral (rat) LD50: &gt;5000 mg/kg&lt;sup&gt;[1]&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>acrylamide homopolymer</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation (rat) LC50: 5.7125 mg/l/30M&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye: slight</td>
<td></td>
</tr>
<tr>
<td>Oral (rat) LD50: &gt;2000 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>sodium carbonate</th>
<th>TOXICITY</th>
<th>IRRITATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>dermal (rat) LD50: &gt;2000 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit): 100 mg/24h moderate</td>
<td></td>
</tr>
<tr>
<td>Inhalation (guinea pig) LC50: 0.4 mg/l/2h&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit): 100 mg/30s mild</td>
<td></td>
</tr>
<tr>
<td>Oral (rat) LD50: 2800 mg/kg&lt;sup&gt;[2]&lt;/sup&gt;</td>
<td>Eye (rabbit): 50 mg SEVERE</td>
<td></td>
</tr>
</tbody>
</table>
### Skin irritation

- **silica crystalline - quartz**: Not Available

**Legend:**
- Data available but does not fill the criteria for classification
- Data available to make classification
- Data Not Available to make classification

#### TOXICITY
Not Available

#### IRRITATION
Not Available

---

### Asthma-like symptoms

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound.

No significant acute toxicological data identified in literature search for bentonite clays:

- Bentonite (CAS No. 1302-78-9) consists of a group of clays formed by crystallisation of vitreous volcanic ashes that were deposited in water.
- The expected acute oral toxicity of bentonite in humans is very low (LD50 > 15 g/kg).

---

### SACRIFICAL SUBSTANCES

#### Acrylamide homopolymer

**Sensitisation (guinea pig): 0% (0/20) OECD 406**

**WARNING:** For inhalation exposure ONLY: This substance has been classified by the IARC as Group 1: CARCINOGENIC TO HUMANS

The International Agency for Research on Cancer (IARC) has classified occupational exposures to respirable (<5 um) crystalline silica as being carcinogenic to humans. This classification is based on what IARC considered sufficient evidence from epidemiological studies of humans for the carcinogenicity of inhaled silica in the forms of quartz and cristobalite.

#### Skin Irritation / Corrosion

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Test Duration (HR)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Toxicity</td>
<td>☑</td>
<td>Carcinogenicity</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Skin Irritation / Corrosion</td>
<td>☑</td>
<td>Reproductivity</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Serious Eye Damage / Irritation</td>
<td>☑</td>
<td>STOT - Single Exposure</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Respiratory or Skin sensitisation</td>
<td>☑</td>
<td>STOT - Repeated Exposure</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>☑</td>
<td>Aspiration Hazard</td>
<td>☑</td>
<td></td>
</tr>
</tbody>
</table>

**Legend:**
- ☑ – Data available but does not fill the criteria for classification
- ☑ – Data available to make classification
- ☑ – Data Not Available to make classification

---

### Section 12 Ecological Information

#### Toxicity

<table>
<thead>
<tr>
<th>Substance</th>
<th>Endpoint</th>
<th>Test Duration (HR)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AMC GEL</strong></td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Bentonite</strong></td>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>19000mg/L</td>
<td>4</td>
</tr>
<tr>
<td><strong>Acrylamide homopolymer</strong></td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Sodium carbonate</strong></td>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>300mg/L</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>-176mg/L</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>EC50</td>
<td>96</td>
<td>Algae or other aquatic plants</td>
<td>242mg/L</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>NOEC</td>
<td>16</td>
<td>Crustacea</td>
<td>424mg/L</td>
<td>4</td>
</tr>
<tr>
<td><strong>Silica crystalline - quartz</strong></td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>
DO NOT discharge into sewer or waterways.
May be harmful to fauna if not disposed of according to Section 13 and legislative requirements. [AMC]

Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>acrylamide homopolymer</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>acrylamide homopolymer</td>
<td>LOW (LogKOW = -0.8074)</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>LOW (LogKOW = -0.4605)</td>
</tr>
</tbody>
</table>

Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>acrylamide homopolymer</td>
<td>LOW (KOC = 10.46)</td>
</tr>
<tr>
<td>sodium carbonate</td>
<td>HIGH (KOC = 1)</td>
</tr>
</tbody>
</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area.

- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.

SECTION 14 TRANSPORT INFORMATION

Labels Required

<table>
<thead>
<tr>
<th>Marine Pollutant</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAZCHEM</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Land transport (ADG): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

BENTONITE(1302-78-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS
Australia Inventory of Chemical Substances (AICS)

ACRYLAMIDE HOMOPOLYMER(9003-05-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS
Australia Inventory of Chemical Substances (AICS)

SODIUM CARBONATE(497-19-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS
SILICA CRYSTALLINE - QUARTZ (14808-60-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards

National Inventory | Status
--- | ---
Australia - AICS | Y
Canada - DSL | Y
Canada - NDSL | N (bentonite; silica crystalline - quartz; acrylamide homopolymer; sodium carbonate)
China - IECSC | N (acrylamide homopolymer)
Europe - EINEC / ELINCS / NLP | N (acrylamide homopolymer)
Japan - ENCS | N (bentonite)
Korea - KECI | Y
New Zealand - NZIoC | Y
Philippines - PICCS | Y
USA - TSCA | Y

Legend:

Y = All ingredients are on the inventory
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Ingredients with multiple cas numbers

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>sodium carbonate</td>
<td>497-19-8, 7542-12-3, 1314087-39-2, 1332-57-6</td>
</tr>
<tr>
<td>silica crystalline - quartz</td>
<td>14808-60-7, 122304-48-7, 122304-49-8, 12425-26-2, 1317-79-9, 70594-95-5, 87347-84-0, 308075-07-2</td>
</tr>
</tbody>
</table>

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings.

Definitions and abbreviations

PC – TWA: Permissible Concentration-Time Weighted Average
PC – STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit,
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL: No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: Clay Breaker
PRODUCT NAME: Quaternary Ammonium Compound
RECOMMENDED USE: Clay stabilizer in industrial applications
SUPPLIER: DCS Fluid Solutions, LP
P.O. Box 1027
Graham, TX 76450
(940) 521-0400
www.dcsmud.com

24-HOUR EMERGENCY TELEPHONE: 940-521-0400

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Acute toxicity 4, Oral
SIGNAL WORD: Warning
HAZARD STATEMENTS: Harmful if swallowed.

SYMBOLS:

PRECAUTIONARY STATEMENTS:
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Avoid contact with eye, skin and clothing.
Wear protective gloves, splash apron, safety glasses or chemical safety goggles.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Remove immediately all contaminated clothing. Rinse skin with water. Wash contaminated clothing before reuse.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If you feel unwell, or irritation of eye/skin persists, call a POISON CENTER or physician.
Store locked up in closed containers at moderate temperatures.
Dispose of contents and container in accordance with local, state, and federal regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME:</th>
<th>CAS No.:</th>
<th>WEIGHT %:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade secret</td>
<td>Trade secret</td>
<td>25</td>
</tr>
</tbody>
</table>
4. FIRST-AID MEASURES

**General:** Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible). If breathing has stopped, trained personnel should begin rescue breathing or, if the heart has stopped, immediately, start cardiopulmonary resuscitation (CPR) or automated external defibrillator.

**Inhalation:** When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

**Skin Contact:** Remove contaminated clothing. Drench affected area with water for at least 15 minutes. Obtain medical attention if irritation develops or persists.

**Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses if present, and easy to do. Continue rinsing. Obtain medical attention if irritation persists.

**Ingestion:** Rinse mouth. Do NOT induce vomiting. Get immediate medical attention.

**Note to physician:** No specific treatment. Treat according to symptoms present.

5. FIREFIGHTING MEASURES

**Extinguishing Media:**
- **Suitable Extinguishing Media:** Use appropriate extinguishing media for the surrounding fire. The product is not flammable.
- **Unsuitable Extinguishing Media:** Not applicable.

**Specific Hazards:**
- No unusual fire or explosion hazards noted.

**Special Protective Equipment and Precautions for Fire-Fighters:**
- Fire-fighters should wear full fire-fighting gear including self-contained breathing apparatus.
- Keep containers cool using water spray or fog.

6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions:**
- Avoid contact with skin, eyes and clothing. Provide adequate ventilation. Use personal protective equipment (PPE) specified in Section 8.

**Environmental Precautions:**
- Prevent spilled material from entering sewers, storm drains and public waters.

**Methods for Containment:**
Stop spill/release if it can be done safely. Contain spills with dikes of sand, earth or other absorbents to prevent migration and entry into the environment and waterways. Local authorities should be advised if significant spillages cannot be contained.

**Methods for Cleanup:**
Clean up spills immediately. Keep area well ventilated. Flush area with water. Do NOT wash into sewer. Recover as much of the solution as possible by vacuum. Absorb remaining solution with inert, non-combustible material. Place in suitable salvage containers. Dispose of waste in accordance with local, state and federal regulations in a chemical waste landfill.

### 7. HANDLING AND STORAGE

**Handling Precautions:**
Always wear recommended personal protection equipment. Do not get in eyes, on skin or clothing. Do not swallow. Use with adequate ventilation. Eating, drinking and smoking in work areas is prohibited.

**Hygienic Work Practices:**
Use good personal hygiene practices. Wash hands and skin thoroughly after handling. Promptly remove contaminated clothing and wash before reuse. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

**Storage Precautions:**
Keep containers tightly closed and properly labeled. Store in cool, dry, well-ventilated area away from heat, sources of ignition and direct sunlight. Keep container closed when not in use. Keep in original container. Store containers in upright position. Since emptied containers retain product residue, follow hazard precautions even when empty.

### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Exposure Limits:**
No Occupational Exposure Limits (OELs) have been established for this product or its chemical components.

**Appropriate Engineering Controls:**
Ensure adequate ventilation.
Emergency eye wash and safety showers should be available in the immediate vicinity of any potential exposure.

**Personal Protective Equipment:**
Eye Protection – Wear chemical safety glasses or safety googles.
Skin Protection – Wear chemical resistant gloves and splash apron.
Respiratory Protection – Ensure adequate ventilation.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance:** Colorless to amber liquid
**Odor:** Very faint
**Odor Threshold:** Not available
**pH:** 6.5 to 9.0
10. STABILITY AND REACTIVITY

Reactivity: Hazardous reactions will not occur under normal conditions.
Chemical Stability: Stable under normal conditions.
Possibility of Hazardous Reactions: Hazardous polymerization will not occur.
Conditions to Avoid: Avoid temperatures exceeding flash point and contact with incompatible material.

11. TOXICOLOGICAL INFORMATION

Routes of Exposure:
   Inhalation: Prolonged inhalation may be harmful.
   Ingestion: Harmful if swallowed. May cause nausea, vomiting, diarrhea or more severe symptoms.
   Skin Contact: Not a dermal irritant.
   Eye Contact: Not an ocular irritant.

Acute Toxicity: Harmful is swallowed
LD50 and LC50: Acute LD50: 1000 – 4000 mg/kg, Rat, Oral
Respiratory or Skin Sensitization: No data available
Carcinogenicity: Not considered a carcinogen by IARC, ACGIH, NTP, or OSHA.
Reproductive Toxicity: Not expected to be hazardous by OSHA criteria.
Germ Cell Mutagenicity: No data available
Specific Target Organ Toxicity – Single Exposure: No data available
Specific Target Organ Toxicity – Repeated Exposure: No data available
Aspiration Hazard: Not classified

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not classified
Persistence and Degradability:
ClayBreaker has a biodegradation percentage of 85.2% and is considered to have ready biodegradability. Test of ready biodegradability are stringent tests that provide limited opportunity for acclimation and biodegradation to occur. A positive result in a test of ready biodegradability is an indication that the test substance will undergo rapid and ultimate biodegradation in the environment. OECD Guideline 301B has set the standard for ready biodegradability at 60%. ClayBreaker exceeds this standard for environmental friendliness.

**Bioaccumulative Potential:** Not established  
**Mobility in Soil:** No data available  
**Other Adverse Effects:** No adverse environmental effects are expected from this product.

### 13. DISPOSAL CONSIDERATIONS

Follow approved local beneficial reuse guidelines for uncontaminated spent drilling fluids. If contaminated, dispose of in a licensed industrial landfill according to local, state and federal regulations. If released to the environment for other than its intended purpose, this product does not meet, in its present state, the definition of a hazardous waste under 40 CFR 261. Under RCRA it is the responsibility of the user of the product to determine at the time of disposal whether the product meets RCRA criteria for hazardous waste. Waste management should be in full compliance with federal, state and local laws. Empty containers retain product residue which may exhibit hazards of material. Do not use for other purposes. Return containers to reclamation centers for proper cleaning and reuse.

### 714. TRANSPORTATION INFORMATION

**U.S. DEPARTMENT OF TRANSPORTATION (DOT):**  
Not regulated as dangerous goods.

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS (TDG):**  
Not regulated as dangerous goods.

**IMDG:**  
Not regulated as dangerous goods.

**IATA:**  
Not regulated as dangerous goods.

### 15. REGULATORY INFORMATION

**OSHA:** This product is listed as a hazardous material under the criteria of Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200. We request that you make all information in the Material Safety Data Sheet available to your employees.

**TSCA:** All components are on the TSCA Inventory List.

**CERCLA:** No reportable quantity.

**SARA TITLE III:**

- **Extremely Hazardous Substance (EHS):** No  
- **Section 312 (Tier II) Ratings:** Immediate (acute) health hazard  
- **Section 313:** Not applicable
RCRA: No

Canada WHMIS: Not on inventory

16. OTHER INFORMATION

CURRENT ISSUE DATE: May 15, 2015

DCS Fluids Solutions, LP believes the information contained in this material safety data sheet is accurate based on the information supplied by reputable suppliers of our raw materials. We cannot make any assertions as to its reliability or completeness; therefore, the user may rely on it only at user’s risk. We have made no effort to censor or conceal deleterious aspects of this product. Since we cannot anticipate or control the conditions under which this information and product may be used, we make no guarantee that the precautions we have suggested will be adequate for all individuals and/or situations. It is the obligation of each user of this product to comply with the requirements of all applicable laws regarding use and disposal of this product. No warranty, either expressed or implied, or liability of any nature with respect to this product or to the data herein is made or incurred hereunder.
SAFETY DATA SHEET

1. Identification
   Product Identifier: POLYMUD Liquid
   Recommended use: Not available
   Recommended restrictions: None known
   Manufacturer/Importer/Supplier/Distributor information
   Manufacturer
   Company name: DCS Fluid Solutions
   Address: PO Box 1027, Graham, TX 76450
   Phone: 940-521-0500
   Website: www.dcsmud.com
   Email: don@dcsmud.com / randy@dcsmud.com
   Emergency phone number: 940-768-8071

2. Hazard(s) Identification
   Physical hazards: Not classified
   Health hazards: Not classified
   Environmental hazards: Not classified
   OSHA defined hazards: Not classified
   Label elements
   Hazard symbol
   Signal word: Warning
   Hazard statement: Causes skin irritation.
   Precautionary statement:
   Prevention: Wear protective gloves/ protective clothing/ eye protection/ face protection. Wash with plenty of soap and water.
   Response: Wash hands after handling.
   Storage: Store away from incompatible materials.
   Disposal: Dispose of waste and residues in accordance with local authority requirements.
Material name: POLYMUD
Date prepared: April 5, 2016
Date revised: September 18, 2017
Version number: 02

Hazard(s) not otherwise classified (HNOC) 
Combustible

Supplemental information 
None

3. Composition/Information of Ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Common name and synonyms</th>
<th>CAS Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Oil</td>
<td></td>
<td>8042-47-5</td>
<td>30-&lt;40</td>
</tr>
<tr>
<td>Other components below reportable levels</td>
<td></td>
<td></td>
<td>60-&lt;70</td>
</tr>
</tbody>
</table>

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

4. First Aid Measures

Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact
Rinse with water. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms, effects, acute and delayed
Direct contact with eyes may cause temporary irritation.

Indication of immediate medical attention and special treatment needed
Treat symptomatically.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Suitable extinguishing media

Unsuitable extinguishing media
None known

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Not available

Firefighting equipment/instructions
Cool containers exposed to heat with water spray and remove container, if no risk is involved.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
Combustible. No unusual fire or explosion hazards noted.

6. Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures
Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid discharge into drains, water courses or onto the ground.

7. Handling and Storage

Precautions for safe handling

Avoid prolonged or repeated contact with skin. Avoid prolonged exposure. Use only in well-ventilated areas.

Conditions for safe storage, including any incompatibilities

Keep away from heat and sources of ignition. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure Controls/Personal Protection

Occupational exposure limits

US OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Oil</td>
<td>PEL</td>
<td>5 mg/m3</td>
<td>Mist.</td>
</tr>
<tr>
<td>(CAS 8042-47-5)</td>
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</tbody>
</table>

US ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Oil</td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>Inhalable fraction</td>
</tr>
<tr>
<td>(CAS 8042-47-5)</td>
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</table>

US NIOSH: Pocket Guide to Chemical Hazards

<table>
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<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Oil</td>
<td>STEL</td>
<td>10 mg/m3</td>
<td>Mist.</td>
</tr>
<tr>
<td>(CAS 8042-47-5)</td>
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</tbody>
</table>

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<td></td>
</tr>
<tr>
<td>(CAS 8042-47-5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) 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. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment

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

- **Skin protection**
  - **Hand protection**
    - Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
  - **Other**

- **Respiratory protection**
  - In case of insufficient ventilation, wear suitable respiratory equipment.

- **Thermal hazards**
  - Wear appropriate thermal protective clothing, when necessary.

**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

**Appearance**

- **Physical state**
  - Liquid
- **Form**
  - Liquid
- **Color**
  - Light Grey to White

- **Odor**
  - None

- **Odor threshold**
  - Not available

- **pH**
  - 4 – 9 @ 5 g/l

- **Melting point/freezing point**
  - Not available

- **Initial boiling point and boiling range**
  - 680 °F (360 °C) estimated

- **Flash point**
  - 275.0 °F (135.0 °C) estimated

- **Evaporation rate**
  - Not available

- **Flammability (solid, gas)**
  - Not applicable

- **Upper/lower flammability or explosive limits**
  - Flammability limit-lower (%) Not available
  - Flammability limit-upper (%) Not available
  - Explosive limit-lower (%) Not available
  - Explosive limit-upper (%) Not available

- **Vapor pressure**
  - 0.00001 hPa estimated

- **Vapor density**
  - Not available

- **Relative density**
  - Not available

**Solubility(ies)**

- **Solubility (water)**
  - Not available

- **Partition coefficient (n-octanol/water)**
  - Not available

- **Auto-ignition temperature**
  - 500 °F (260 °C) estimated

- **Decomposition temperature**
  - Not available

- **Viscosity**
  - Not available

**Other Information**

- **Density**
  - 0.87 g/cm³ estimated
- **Flammability class**
  - Combustible IIIB estimated
- **Percent volatile**
  - 34% estimated
- **Specific gravity**
  - 0.87 estimated
10. Stability and Reactivity

Reactivity

The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability

Material is stable under normal conditions.

Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid

Contact with incompatible materials.

Incompatible materials

Strong oxidizing agents.

Hazardous decomposition products

Carbon oxides. Nitrogen oxides (NOx).

11. Toxicological Information

Information on likely routes of exposure

Inhalation

Prolonged inhalation may be harmful.

Skin contact

No adverse effects due to skin contact are expected.

Eye contact

Direct contact with eyes may cause temporary irritation.

Ingestion

Expected to be a low ingestion hazard.

Symptoms related to the physical, chemical and toxicological characteristics

Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity

Not available

Skin corrosion/irritation

Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation

Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Not a respiratory sensitizer.

Respiratory sensitization

This product is not expected to cause skin sensitization.

Skin sensitization

This product is not expected to cause skin sensitization.

Germ cell mutagenicity

No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Reproductive toxicity

This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure

Not classified

Specific target organ toxicity - repeated exposure

Not classified

Aspiration hazard

Not an aspiration hazard.

Chronic effects

Prolonged inhalation may be harmful.

12. Ecological Information

Ecotoxicity

The product is 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.

Persistence and degradability

No data is available on the degradability of this product.

Bioaccumulative potential

No data available.
Mobility in soil
No data available.

Other adverse effects
No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposable Considerations
Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

Local disposal regulations
Dispose in accordance with all applicable regulations.

Hazardous waste code
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues/unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging
Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport Information
DOT
Not regulated as dangerous goods.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not established.

15. Regulatory Information
US Federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Not listed.
Hazard Categories

Immediate Hazard: No
Delayed Hazard: No
Fire Hazard: No
Pressure Hazard: No
Reactivity Hazard: No

SARA 302 Extremely hazardous substance
SARA 311/312 Hazardous chemical
SARA 313 (TRI reporting)

Not listed
Not regulated

Other federal regulations
Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Clean Air Act (CAA) Section 112(r)
Accidental Release Prevention (40 CFR 68.130)
Safe Drinking Water Act (SDWA)

Not regulated
Not regulated

US state regulations
US California Controlled Substances, CA
Department of Justice (California Health and Safety Code Section 11100)

Not listed

US Massachusetts RTK – Substance List
US New Jersey Worker and Community Right-to-Know Act
US Pennsylvania Worker and Community Right-to-Know Law
US Rhode Island RTK
US California Proposition 65

MINERAL OIL (CAS 8042-47-5)
Not listed
MINERAL OIL (CAS 8042-47-5)
Not regulated.
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

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

*A “Yes” indicates that all components of this product comply 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
Date Prepared: April 5, 2016
Revision Date: April 5, 2016
Version Number: 01

Disclaimer: The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. All information and recommendations concerning this product is based on tests and data believed to be reliable, however, it is the user’s responsibility to determine the safety, toxicity and suitability for the user’s own use of the product described herein. Since the actual use by others is beyond our control, no guarantee expressed or implied is made. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular conditions exist or because of applicable laws or government regulations.
SAFETY DATA SHEET

1. Identification
   
   Product Identifier: Sandmaster
   
   Recommended use: Drilling fluid additive
   
   Recommended restrictions: None known
   
   Manufacturer/Importer/Supplier/Distributor information
   
   Manufacturer:
   
   Company name: DCS Fluid Solutions
   Address: PO Box 1027, Graham, TX 76450
   Phone: 940-521-0500
   Website: www.dcsmud.com
   Email: don@dcsmud.com / randy@dcsmud.com
   Emergency phone number: 940-768-8071

2. Hazard(s) Identification

   Physical hazards: Not classified
   
   Health hazards: Not classified
   
   Environmental hazards: Not classified
   
   OSHA defined hazards: Not classified

   Label elements
   
   Hazard symbol: None
   
   Signal word: None
   
   Hazard statement: The substance does not meet the criteria for classification.
   Precautionary statement
   
   Prevention: Observe good industrial hygiene practices.
   Response: Wash hands after handling.
   Storage: Store away from incompatible materials.
   Disposal: Dispose of waste and residues in accordance with local authority requirements.

   Hazard(s) not otherwise classified (HNOC): None known
   
   Supplemental information: None

3. Composition/Information of Ingredients

   Mixtures
   
   Chemical Name: Xanthan Gum
   Common name and synonyms: Xanthan Gum
   CAS Number: 11138-66-2

   The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.
4. First Aid Measures

Inhalation
Move to fresh air. Seek medical attention if symptoms develop or persist.

Skin contact
Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact
Flush with fresh water for 15 minutes. Get medical attention if irritation develops and persists.

Ingestion
First aid is not normally required. If symptoms develop seek medical attention.

Most important symptoms, effects, acute and delayed
Direct contact with eyes may cause temporary irritation.

Indication of immediate medical attention and special treatment needed
Treat symptomatically.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Suitable extinguishing media

Unsuitable extinguishing media
None known

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed. Organic dusts can form explosive mixtures in air. Do not release runoff from fire control methods to sewers or waterways.

Firefighting equipment/instructions
Because fire may produce toxic thermal decomposition products, wear a self-contained breathing apparatus (SCBA) with a full facepiece operated in pressure-demand or positive-pressure mode.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
Combustible. No unusual fire or explosion hazards noted.

6. Accidental Release Measures

Personal precautions, protective equipment, and emergency procedures
Keep unnecessary personnel away. For personal protection, see section 8 of the SDS.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Following product recovery, flush area with water.

Small Spills: Sweep up material for disposal or recovery. Clean surface thoroughly to remove residual contamination.
Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.
Avoid discharge into drains, water courses or onto the ground.

7. Handling and Storage
Precautions for safe handling
Use good personal hygiene practices. All hazard precautions given in the data sheet must be observed.

Conditions for safe storage, including any incompatibilities
Store in a cool dry space-Temp. <75°C. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure Controls/Personal Protection

Engineering Controls:
Ventilation: Provide general or local exhaust ventilation systems to maintain airborne concentrations below OSHA PELs (Sec. 2). Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

Administrative Controls:
Respiratory Protection: Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres. If respirators are used, OSHA requires a written respiratory protection program that includes at least: medical certification, training, fit-testing, periodic environmental monitoring, maintenance, inspection, cleaning, and convenient, sanitary storage areas.

Protective Clothing/Equipment: Wear chemically protective gloves, boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (29 CFR 1910.133). Contact lenses are not eye protective devices. Appropriate eye protection must be worn instead of, or in conjunction with contact lenses.
Safety Stations: Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.
Contaminated Equipment: Separate contaminated work clothes from street clothes. Launder before reuse. Remove this material from your shoes and clean personal protective equipment.
Comments: Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics.

9. Physical and Chemical Properties

| Physical State: solid |
| Appearance and Odor: beige powder/bland odor |
| Odor Threshold: |
| Vapor Pressure: |
| Vapor Density |
| (Air=1): Formula |
| Weight: Density: |
| Specific Gravity (H2O=1, at 4 °C): 1.5 @ 77 °F |

Water Solubility:
soluble Other

Solubilities: Boiling Point: no data
Freezing/Melting Point: no data
Viscosity: no data
Refractive Index: Surface

Material name: Xanthan Gum
Date prepared: April 5, 2016
Date revised: May 22, 2018
Version number: 03
10. Stability and Reactivity
   **Stability:** Xanthan Gum is stable at room temperature in closed containers under normal storage and handling conditions.
   **Polymerization:** Hazardous polymerization cannot occur.
   **Chemical Incompatibilities:** Strong oxidizing agents.
   **Conditions to Avoid:** Protect from moisture.
   **Hazardous Decomposition Products:** Thermal oxidative decomposition of Xanthan Gum can produce carbon dioxide and carbon monoxide.

11. Toxicological Information
   **Toxicity Data:**
   * Acute Oral Effects:
     Rat, oral, LD50: mg/kg
   * Chronic Effects: no data available
   * Carcinogenicity: : no data available
   * Mutagenicity: : no data available
   * Teratogenicity: : no data available

   * See NIOSH, RTECS, for additional toxicity data.

12. Ecological Information
   **Ecotoxicity:** no data available
   **Environmental Fate:** no data available
   **Environmental Degradation:** no data available
   **Soil Absorption/Mobility:** no data available

14. Transport Information

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
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<td>PSN:</td>
</tr>
<tr>
<td>UN Number:</td>
<td></td>
<td>Hazard Class:</td>
</tr>
<tr>
<td>Packing</td>
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<table>
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<td>Packing</td>
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<td></td>
</tr>
</tbody>
</table>

Material name: Xanthan Gum
Date prepared: April 5, 2016
Date revised: May 22, 2018
Version number: 03
15. Regulatory Information

US FEDERAL

TSCA
CAS# 11138-66-2 is listed on the TSCA inventory.

Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.

Section 12b
None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.

CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ. SARA 311/312 Hazards: No SARA Hazards

Section 313
No chemicals are reportable under Section 313.

Clean Air Act:
This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors. Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.

State and Local Regulations - California Proposition 65: None

16. Other Information, Including Date of Preparation or Last Revision
Date Prepared: April 5, 2016
Revision Date: May 22, 2018
Version Number: 03

Disclaimer: The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. All information and recommendations concerning this product is based on tests and data believed to be reliable, however, it is the user's responsibility to determine the safety, toxicity and suitability for the user's own use of the product described herein. Since the actual use by others is beyond our control, no guarantee expressed or implied is made. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular conditions exist or because of applicable laws or government regulations.

Material name: Xanthan Gum
Date prepared: April 5, 2016
Date revised: May 22, 2018
Version number: 03
1. IDENTIFICATION

Product Identifier
Product Name TorqBreaker

Other means of identification
Product Code ABD

Recommended use of the chemical and restrictions on use
Recommended Use Surfactant additive.

Details of the supplier of the safety data sheet
Supplier Address DCS Fluid Solutions
516 2nd Street
Graham, TX 76450

Emergency Telephone Number
Company Phone Number 1-940-521-0500
Emergency Telephone (24 hr) INFOTRAC 1-352-323-3500 (International)
1-800-535-5053 (North America)

2. HAZARDs IDENTIFICATION

Appearance Red liquid Physical State Liquid Odor Bland

Classification
Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 1

Signal Word Danger

Hazard Statements
Causes skin irritation
Causes serious eye damage

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection
Precautionary Statements - Response
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing immediately call a poison center or doctor/physician
IF ON SKIN: Wash With plenty of soap and water
Take off contaminated clothing and wash it before reuse.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkyl dimethyl ammonium chloride</td>
<td>68424-85-1</td>
<td>&lt;5.0</td>
</tr>
<tr>
<td>Ethanolamine</td>
<td>141-43-5</td>
<td>&lt;3.0</td>
</tr>
</tbody>
</table>

4. FIRST-AID MEASURES

First Aid Measures

General Advice If exposed or concerned: Get medical advice/attention.

Eye Contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists: Get medical advice/attention.

Skin Contact Take off contaminated clothing. Wash with plenty of water. If irritation persists, seek medical attention.

Inhalation None under normal use conditions.

Ingestion Give large quantities of water. Do not induce vomiting. Get medical attention.

Most important symptoms and effects

Symptoms Prolonged or repeated skin contact may cause irritation. Eye contact may be slightly irritating.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media Not determined.

Specific Hazards Arising from the Chemical
None known.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions Use personal protective equipment as required.

Methods and material for containment and cleaning up

Methods for Containment Prevent further leakage or spillage if safe to do so.
**Methods for Clean-Up**

Flood area with water and then mop up. Dispose of in accordance with federal, state and local regulations.

---

**7. HANDLING AND STORAGE**

**Precautions for safe handling**

**Advice on Safe Handling**

Handle in accordance with good industrial hygiene and safety practice. Do not destroy or deface the label. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

**Conditions for safe storage, including any incompatibilities**

**Storage Conditions**

Keep containers tightly closed in a dry, cool and well-ventilated place. Store containers upright. Store locked up.

**Incompatible Materials**

None known based on information supplied.

---

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Exposure Guidelines**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanolamine</td>
<td>STEL: 6 ppm</td>
<td>TWA: 3 ppm</td>
<td>IDLH: 30 ppm</td>
</tr>
<tr>
<td></td>
<td>TWA: 3 ppm</td>
<td>TWA: 6 mg/m³</td>
<td>TWA: 3 ppm</td>
</tr>
<tr>
<td></td>
<td>(vacated) TWA: 3 ppm</td>
<td>(vacated) STEL: 6 ppm</td>
<td>(vacated) STEL: 6 ppm</td>
</tr>
<tr>
<td></td>
<td>(vacated) TWA: 8 mg/m³</td>
<td>(vacated) STEL: 15 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**

**Engineering Controls**

None under normal use conditions.

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

**Eye/Face Protection**

Avoid contact with eyes.

**Skin and Body Protection**

No protective equipment is needed under normal use conditions.

**Respiratory Protection**

No protective equipment is needed under normal use conditions.

**General Hygiene Considerations**

Handle in accordance with good industrial hygiene and safety practice.

---

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>Red liquid</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>Bland</td>
<td></td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>Melting Point/Freezing Point</td>
<td>Not available</td>
<td></td>
</tr>
<tr>
<td>Boiling Point/Boiling Range</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>None (will not burn)</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Flammability (Solid, Gas)</td>
<td>n/a-liquid</td>
<td></td>
</tr>
</tbody>
</table>
Upper Flammability Limits Not determined
Lower Flammability Limit Not determined
Vapor Pressure Not available
Vapor Density Not determined
Specific Gravity 1.024 (1=Water)
Water Solubility Completely soluble
Solubility in other solvents Not determined
Partition Coefficient Not determined
Auto-ignition Temperature Not determined
Decomposition Temperature Not determined
Kinematic Viscosity Not determined
Dynamic Viscosity Not determined
Explosive Properties Not determined
Oxidizing Properties Not determined

10. STABILITY AND REACTIVITY

Reactivity
Not reactive under normal conditions.

Chemical Stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions
None under normal processing.

Conditions to Avoid
None known.

Incompatible Materials
None known based on information supplied.

Hazardous Decomposition Products
None known based on information supplied.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information

Eye Contact           Avoid contact with eyes.
Skin Contact          Avoid contact with skin.
Inhalation            Under normal conditions of intended use, this material is not expected to be an inhalation hazard.
Ingestion             Do not taste or swallow.

Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkyl dimethyl benzyl ammonium chloride (C12-16) 86424-85-1</td>
<td>= 426 mg/kg ( Rat )</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Information on physical, chemical and toxicological effects

Symptoms  Please see section 4 of this SDS for symptoms.
12. ECOLOGICAL INFORMATION

Ecotoxicity
An environmental hazard cannot be excluded in the event of unprofessional handling of disposal.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Algae/aquatic plants</th>
<th>Fish</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanolamine</td>
<td>15:72 h Desmodesmus</td>
<td>227: 96 h Pimephales</td>
<td>EC50 = 110 mg/L 17 h</td>
<td>4.2: 24 h Daphnia magna</td>
</tr>
<tr>
<td>141-43-5</td>
<td>Subspicals mg/L EC50</td>
<td>Promelas mg/L LC50 flow-</td>
<td>EC50 = 12200 mg/L 2 h</td>
<td>mg/L EC50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Through 3684: 96 h</td>
<td>EC50 = 13.7 mg/L 30 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Brachydanio rerio mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50 static 300-1000: 96 h</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lepomis macrochirus mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50 static 114-196: 96 h</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50 static 200: 96 h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Persistence/Degradability
| Not determined.                                      |

Bioaccumulation
Not determined.

Mobility
Not determined.

Other Adverse Effects
Not determined.

13. DISPOSAL CONSIDERATIONS

Waste Treatment Methods

Disposal of Wastes
Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated Packaging
Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION

Note
Please see current shipping paper for most up to date shipping information, including exemptions and special circumstances.

DOT
Not regulated

IATA
Not regulated

IMDG
Marine Pollutant
This material may meet the definition of a marine pollutant

15. REGULATORY INFORMATION

International Inventories

TSCA
Listed

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances
US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

US State Regulations

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanolamine 141-43-5</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Instability</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not determined</td>
<td>Not determined</td>
<td>Not determined</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Physical Hazards</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>0</td>
<td>1</td>
<td>C = Goggles, gloves, apron</td>
</tr>
</tbody>
</table>

Issue Date: 01-May-2018
Revision Date: -
Revision Note: -

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End of Safety Data Sheet
SAFETY DATA SHEET

1. Identification
   Product Identifier: DCS SealPac HV
   Recommended use: Fluid Loss Additive
   Recommended restrictions: No information available
   Manufacturer/Importer/Supplier/Distributor information
   Manufacturer:
   - Company name: DCS Fluid Solutions
   - Address: PO Box 1027 Graham, TX 76450
   - Phone: 940-521-0500
   - Website: www.dcsfluid.com
   - Email: don@dcsfluid.com
   - Emergency phone number: 940-521-0500

2. Hazard(s) Identification
   Physical hazards: Not classified
   Health hazards: Not classified
   Environmental hazards: Not classified
   OSHA defined hazards: Not classified
   Label elements:
   - Hazard symbol: None
   - Signal word: None
   - Hazard statement: The substance does not meet the criteria for classification.
   - Precautionary statement:
     - Prevention: Observe good industrial hygiene practices.
     - Response: Wash hands after handling.
     - Storage: Store away from incompatible materials.
     - Disposal: Dispose of waste and residues in accordance with local authority requirements.
   - Hazard(s) not otherwise classified (HNOC): None Known
   - Supplemental information: None

3. Composition/Information of Ingredients
   Substances
   The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.
<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>None</td>
<td>Proprietary</td>
<td>60-100</td>
</tr>
</tbody>
</table>

4. First Aid Measures
   Material name: DCS SealPac HV
   Date prepared: May 12, 2016
   Date revised: 10/10/2017
   Version number: 02
Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact
Do not rub eyes. Rinse with water. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms, effects, acute and delayed
Dusts may irritate the respiratory tract, skin and eyes.

Indication of immediate medical attention and special treatment needed
Treat symptomatically.

General information
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures
Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Firefighting equipment/instructions
Use water spray to cool unopened containers.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
No unusual fire or explosion hazards noted.

6. Accidental Release Measures
Personal precautions, protective equipment, and emergency procedures
Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. For personal protection, see section 8 of the SDS. Avoid the generation of dusts during clean-up. Collect dust using a vacuum cleaner equipped with HEPA filter. Stop the flow of material, if this is without risk. Large Spills: Wet down with water and dike for later disposal. Shovel the material into waste container. Following product recovery, flush area with water. Small Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal. For waste disposal, see section 13 of the SDS.

Methods and materials for containment and cleaning up

Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and Storage
Material name: DCS SealPac HV
Date prepared: May 12, 2016
Date revised: 10/10/2017
Version number: 02
Precautions for safe handling

Minimize dust generation and accumulation. Provide appropriate exhaust ventilation at places where dust is formed. Practice good housekeeping.

Conditions for safe storage, including any incompatibilities

Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure Controls/Personal Protection

Occupational exposure limits

No exposure limits noted for ingredient(s).

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits.

Individual protection measures, such as personal protective equipment

Eye/face protection

Wear safety glasses with side shields (or goggles).

Skin protection

Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.

Hand protection

Wear suitable protective clothing.

Other

Respiratory protection

Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.

Thermal hazards

Wear appropriate thermal protective clothing, when necessary.

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

Appearance

Physical state

Solid

Form

Powder

Color

White to Light yellow

Odor

Odorless

Odor threshold

Not available

pH

Not available

Melting point/freezing point

Not available

Initial boiling point and boiling range

Not available

Flash point

Not available

Evaporation rate

Not available

Flammability (solid, gas)

Not available

Upper/lower flammability or explosive limits

Flammability limit-lower (%)

Not available

Flammability limit-upper (%)

Not available

Explosive limit-lower (%)

Not available

Explosive limit-upper (%)

Not available
Vapor pressure: Not available
Vapor density: Not available
Relative density: Not available
Solubility(ies):
  Solubility (water): Not available
Partition coefficient (n-octanol/water): Not available
Auto-ignition temperature: Not available
Decomposition temperature: Not available
Viscosity: Not available
Other Information:
  Explosive properties: Not explosive
  Molecular formula: Unspecified
  Oxidizing properties: Not oxidizing
  Percent volatile: 0 %
  VOC (Weight %): 0 %

10. Stability and Reactivity
Reactivity
The product is stable and non-reactive under normal
conditions of use, storage and transport.
Chemical stability
Material is stable under normal conditions.
Possibility of hazardous reactions
No dangerous reaction known under conditions of normal use.
Conditions to avoid
Contact with incompatible materials.
Incompatible materials
Strong oxidizing agents.
Hazardous decomposition products
No hazardous decomposition products are known.

11. Toxicological Information
Information on likely routes of exposure
Inhalation
Dust may irritate respiratory system.
Skin contact
Dust or powder may irritate the skin.
Eye contact
Dust may irritate the eyes.
Ingestion
Expected to be a low ingestion hazard.
Symptoms related to the physical, chemical and
toxicological characteristics
Dusts may irritate the respiratory tract, skin and eyes.
Information on toxicological effects
Acute toxicity
Not available
Skin corrosion/irritation
Prolonged skin contact may cause temporary irritation.
Serious eye damage/eye irritation
Direct contact with eyes may cause temporary irritation.
Respiratory or skin sensitization
Not a respiratory sensitizer.
  Respiratory sensitization
This product is not expected to cause skin sensitization.
  Germ cell mutagenicity
No data available to indicate product or any components
  present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity
This product is not considered to be a carcinogen by IARC,
  ACGIH, NTP, or OSHA.
Reproductive toxicity

Specific target organ toxicity - single exposure
Specific target organ toxicity - repeated exposure
Aspiration hazard

This product is not expected to cause reproductive or developmental effects.
Not classified
Not classified
Not an aspiration hazard.

12. Ecological Information
Ecotoxicity

The product is 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.

Persistence and degradability
Bioaccumulative potential
Mobility in soil
Other adverse effects

No data is available on the degradability of this product.
No data available.
No data available.
No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposable Considerations
Disposal instructions

Collect and reclaim or dispose at licensed waste disposal site.

Local disposal regulations
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Hazardous waste code

Waste from residues/unused products
Dispose of in accordance with local regulations.

Contaminated packaging
Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport Information
DOT
IATA
IMDG

Not regulated as dangerous goods.
Not regulated as dangerous goods.
Not regulated as dangerous goods.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable.

15. Regulatory Information

US Federal regulations

All components are on the U.S. EPA TSCA Inventory List. This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. Not regulated.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)
Not listed.

SARA 304 Emergency release notification
Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Immediate Hazard: No
Delayed Hazard: No
Fire Hazard: No
Pressure Hazard: No
Reactivity Hazard: No

Not listed.

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical

Not regulated.

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
Not regulated.

Clean Air Act (CAA) Section 112(r)
Not regulated.

Accidental Release Prevention (40 CFR 68.130)
Not regulated.

Safe Drinking Water Act (SDWA)
Not regulated.

US state regulations

US California Controlled Substances. CA Department of Justice (California Health and Safety Code Section 11100)
Not listed.

US Massachusetts RTK – Substance List
Not regulated.

US New Jersey Worker and Community Right-to-Know Act
Not listed.

US Pennsylvania Worker and Community Right-to-Know Law
Not listed.

US Rhode Island RTK
Not regulated.

US California Proposition 65
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.
International Inventories

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

*A “Yes” indicates that all components of this product comply 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
Date Prepared: May 12, 2016
Revision Date: October 10, 2017
Version Number: 02

Disclaimer: The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. All information and recommendations concerning this product is based on tests and data believed to be reliable, however, it is the user’s responsibility to determine the safety, toxicity and suitability for the user’s own use of the product described herein. Since the actual use by others is beyond our control, no guarantee expressed or implied is made. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular conditions exist or because of applicable laws or government regulations.
SAFETY DATA SHEET

Product Trade Name: BARA-KADE® BENTONITE

Revision Date: 14-Aug-2017  Revision Number: 11

1. Identification

1.1. Product Identifier
Product Trade Name: BARA-KADE® BENTONITE
Synonyms: None
Chemical Family: Mineral
Internal ID Code: HM005230

1.2. Recommended use and restrictions on use
Application: Additive
Uses advised against: No information available

1.3. Manufacturer's Name and Contact Details
Manufacturer/Supplier
BENTONITE Performance Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032
Telephone: (281) 871-7900

Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

Prepared By
Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:
Emergency Telephone Number 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1. Classification in accordance with paragraph (d) of §1910.1200

<table>
<thead>
<tr>
<th>Classification</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carcinogenicity</td>
<td>1A - H350</td>
</tr>
<tr>
<td>Specific Target Organ Toxicity</td>
<td>1 - H372</td>
</tr>
</tbody>
</table>

2.2. Label Elements

Hazard Pictograms
Signal Word: Danger

Hazard Statements
H350 - May cause cancer by inhalation
H372 - Causes damage to organs through prolonged or repeated exposure if inhaled

Precautionary Statements

Prevention
P201 - Obtain special instructions before use
P202 - Do not handle until all safety precautions have been read and understood
P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P280 - Wear protective gloves/protective clothing/eye protection/face protection

Response
P308 + P313 - IF exposed or concerned: Get medical advice/attention
P314 - Get medical attention/advice if you feel unwell

Storage
P405 - Store locked up

Disposal
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations

2.3 Hazards not otherwise classified
This product contains Wyoming bentonite or other sorptive clays. Crystalline silica forms found in this particular clay are limited to quartz. Extreme temperatures that can generate cristobalite or tridymite are not expected to occur under realistic conditions. In addition, all quartz found in sorptive clays are considered "occluded", i.e., strongly coated with an amorphous silica surface. Occluded quartz has been experimentally-determined to be relatively non-toxic compared to unoccluded quartz. A lack of health effects found in several studies examining occupational exposure to sorptive clays also suggest that chronic inhalation of sorptive clays is not expected to result in silicosis or cancer. In light of these findings OSHA has recently exempted Wyoming bentonite and other sorptive clays from the crystalline silica PEL in §1910.1053(a)(1)(iii).

3. Composition/information on Ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>1 - 5%</td>
<td>Carc. 1A (H350) STOT RE 1 (H372)</td>
</tr>
</tbody>
</table>

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures
Inhalation: If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Skin: Wash with soap and water. Get medical attention if irritation persists.
Ingestion: Under normal conditions, first aid procedures are not required.

4.2 Most important symptoms/effects, acute and delayed
Breathing crystalline silica can cause lung disease, including silicosis and lung cancer. Crystalline silica has also been associated with scleroderma and kidney disease.

4.3. Indication of any immediate medical attention and special treatment needed
Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media
Suitable Extinguishing Media
All standard fire fighting media
Extinguishing media which must not be used for safety reasons
None known.

5.2 Specific hazards arising from the substance or mixture
Special exposure hazards in a fire
Decomposition in fire may produce harmful gases.

5.3 Special protective equipment and precautions for fire-fighters
Special protective equipment for firefighters
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid creating and breathing dust.
See Section 8 for additional information

6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up
Collect using dustless method and hold for appropriate disposal. Consider possible toxic or fire hazards associated with contaminating substances and use appropriate methods for collection, storage and disposal.

7. Handling and storage

7.1. Precautions for safe handling
Handling Precautions
This product contains quartz, cristobalite, and/or tridymite which may become airborne without a visible cloud. Avoid breathing dust. Avoid creating dusty conditions. Use only with adequate ventilation to keep exposure below recommended exposure limits. Wear a NIOSH certified, European Standard En 149, or equivalent respirator when using this product. Material is slippery when wet.
Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Storage Information
Use good housekeeping in storage and work areas to prevent accumulation of dust. Close container when not in use. Do not reuse empty container.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits
<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>OSHA PEL-TWA</th>
<th>ACGIH TLV-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>TWA: 50 µg/m³</td>
<td>TWA: 0.025 mg/m³</td>
</tr>
</tbody>
</table>

Exposures to crystalline silica that result from bentonite or other sorptive clays are exempt from the PEL in §1910.1053. The PEL in §1910.1000 Table Z–3 (i.e., the formula that is approximately equivalent to 100 µg/m³) applies to occupational exposures to respirable crystalline silica from sorptive clays.

8.2 Appropriate engineering controls
Engineering Controls
Use approved industrial ventilation and local exhaust as required to maintain exposures below applicable exposure limits.

8.3 Individual protection measures, such as personal protective equipment
Personal Protective Equipment
If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection
Not normally needed. But if significant exposures are possible then the following respirator is recommended:
Dust/mist respirator. (N95, P2/P3)

Hand Protection
Normal work gloves.

Skin Protection
Wear clothing appropriate for the work environment. Dusty clothing should be laundered before reuse. Use precautionary measures to avoid creating dust when removing or laundering clothing.

Eye Protection
Wear safety glasses or goggles to protect against exposure.

Other Precautions
None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State:</td>
<td>Solid</td>
</tr>
<tr>
<td>Odor:</td>
<td>Odorless</td>
</tr>
<tr>
<td>Color</td>
<td>Various</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH:</td>
<td>8-10</td>
</tr>
<tr>
<td>Freezing Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>2.65</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Insoluble in water</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

9.2. Other information
VOC Content (%)
No data available
10. Stability and Reactivity

10.1. Reactivity
Not expected to be reactive.

10.2. Chemical stability
Stable

10.3. Possibility of hazardous reactions
Will Not Occur

10.4. Conditions to avoid
None anticipated

10.5. Incompatible materials
Hydrofluoric acid.

10.6. Hazardous decomposition products
Amorphous silica may transform at elevated temperatures to tridymite (870°C) or cristobalite (1470°C).

11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure: Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

**Acute Toxicity**

**Inhalation**
Inhaled crystalline silica in the form of quartz or cristobalite from occupational sources is carcinogenic to humans (IARC, Group 1). There is sufficient evidence in experimental animals for the carcinogenicity of tridymite (IARC, Group 2A).

Breathing silica dust may cause irritation of the nose, throat, and respiratory passages. Breathing silica dust may not cause noticeable injury or illness even though permanent lung damage may be occurring. Inhalation of dust may also have serious chronic health effects (See "Chronic Effects/Carcinogenicity" subsection below).

**Eye Contact**
May cause mechanical irritation to eye.

**Skin Contact**
None known.

**Ingestion**
None known.

**Chronic Effects/Carcinogenicity**
Silicosis: Excessive inhalation of respirable crystalline silica dust may cause a progressive, disabling, and sometimes-fatal lung disease called silicosis. Symptoms include cough, shortness of breath, wheezing, non-specific chest illness, and reduced pulmonary function. This disease is exacerbated by smoking. Individuals with silicosis are predisposed to develop tuberculosis.

Cancer Status: The International Agency for Research on Cancer (IARC) has determined that crystalline silica inhaled in the form of quartz or cristobalite from occupational sources can cause lung cancer in humans (Group 1 - carcinogenic to humans) and has determined that there is sufficient evidence in experimental animals for the carcinogenicity of tridymite (Group 2A - possible carcinogen to humans). Refer to IARC Monograph 68, Silica, Some Silicates and Organic Fibres (June 1997) in conjunction with the use of these minerals. The National Toxicology
Program classifies respirable crystalline silica as "Known to be a human carcinogen". Refer to the 9th Report on Carcinogens (2000). The American Conference of Governmental Industrial Hygienists (ACGIH) classifies crystalline silica, quartz, as a suspected human carcinogen (A2). There is some evidence that breathing respirable crystalline silica or the disease silicosis is associated with an increased incidence of significant disease endpoints such as scleroderma (an immune system disorder manifested by scarring of the lungs, skin, and other internal organs) and kidney disease.

This product contains Wyoming bentonite or other sorptive clays. Crystalline silica forms found in this particular clay are limited to quartz. Extreme temperatures that can generate cristobalite or tridymite are not expected to occur under realistic conditions. In addition, all quartz found in sorptive clays are considered “occluded”, i.e., strongly coated with an amorphous silica surface (Wendlandt et al., 2007; Hochella and Muryama, 2010; SMI, 2014). Occluded quartz has been experimentally-determined to be relatively non-toxic compared to unoccluded quartz (Geh et al., 2006; Creutzenberg et al., 2008). A lack of health effects found in several studies examining occupational exposure to sorptive clays also suggest that chronic inhalation of sorptive clays is not expected to result in silicosis or cancer (Waxweiler et al., 1988; ACGIH, 1991; USEPA, 1996; IARC, 2005). In light of these findings OSHA has recently exempted Wyoming bentonite and other sorptive clays from the crystalline silica PEL in §1910.1053(a)(1)(iii).

11.3 Toxicity data

**Toxicology data for the components**

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>&gt; 15,000 mg/kg (human)</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin corrosion/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Non-irritating to the skin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Serious eye damage/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Non-irritating to the eye</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Respiratory Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mutagenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Not regarded as mutagenic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Carcinogenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Contains crystalline silica which may cause silicosis, a delayed and progressive lung disease. The IARC and NTP have determined there is sufficient evidence in humans of the carcinogenicity of crystalline silica with repeated respiratory exposure.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Reproductive toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - single exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No significant toxicity observed in animal studies at concentration requiring classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - repeated exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Causes damage to organs through prolonged or repeated exposure if inhaled: (Lungs)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Aspiration hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
12. Ecological Information

12.1. Toxicity

<table>
<thead>
<tr>
<th>Substance Ecotoxicity Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substances</strong></td>
</tr>
<tr>
<td>Crystalline silica, quartz</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th><strong>Substances</strong></th>
<th><strong>CAS Number</strong></th>
<th><strong>Persistence and Degradability</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>The methods for determining biodegradability are not applicable to inorganic substances.</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th><strong>Substances</strong></th>
<th><strong>CAS Number</strong></th>
<th><strong>Log Pow</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th><strong>Substances</strong></th>
<th><strong>CAS Number</strong></th>
<th><strong>Mobility</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.5 Other adverse effects

No information available

13. Disposal Considerations

13.1. Waste treatment methods

**Disposal methods**
Bury in a licensed landfill according to federal, state, and local regulations.

**Contaminated Packaging**
Follow all applicable national or local regulations.

14. Transport Information

**US DOT**
- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
- **Transport Hazard Class(es)**: Not applicable
- **Packing Group**: Not applicable
- **Environmental Hazards**: Not applicable

**Canadian TDG**
- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
- **Transport Hazard Class(es)**: Not applicable
- **Packing Group**: Not applicable
- **Environmental Hazards**: Not applicable

**IMDG/IMO**
- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

IATA/ICAO
UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

Special Precautions for User None

15. Regulatory Information

US Regulations

US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>TSCA Significant New Use Rules - S5A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA Title III Extremely Hazardous Substances

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA (311,312) Hazard Class

Chronic Health Hazard

EPA SARA (313) Chemicals

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxic Release Inventory (TRI) - Group I</th>
<th>Toxic Release Inventory (TRI) - Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA CERCLA/Superfund Reportable Spill Quantity

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>CERCLA RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>carcinogen</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>MA Right-to-Know Law</th>
<th>NJ Right-to-Know Law</th>
<th>PA Right-to-Know Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalline silica, quartz</td>
<td>14808-60-7</td>
<td>Carcinogen</td>
<td>1660</td>
<td>Present</td>
</tr>
</tbody>
</table>

NFPA Ratings: Health 0, Flammability 0, Reactivity 0
HMIS Ratings: Health 0*, Flammability 0, Physical Hazard 0, PPE: E

Canadian Regulations
Canadian Domestic Substances  All components listed on inventory or are exempt.
List (DSL)

16. Other information

Preparation Information
Prepared By: Chemical Stewardship
 Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 14-Aug-2017

Reason for Revision: SDS sections updated:
1
2
8
11

Additional information
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data
www.ChemADVISOR.com/

Disclaimer Statement
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any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet
1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Trade Name: EZ-MUD® GOLD

Synonyms: None

Chemical Family: Anionic Polymer

Application: Additive

Manufacturer/Supplier: Baroid Fluid Services
Product Service Line of Halliburton
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000
Emergency Telephone: (281) 575-5000

Prepared By: Chemical Compliance
Telephone: 1-580-251-4335
e-mail: fdunexchem@halliburton.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>ACGIH TLV-TWA</th>
<th>OSHA PEL-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances</td>
<td>Mixture</td>
<td>60 - 100%</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Hazard Overview: May cause eye and skin irritation. Airborne dust may be explosive.

4. FIRST AID MEASURES

Inhalation: If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Skin: Wash with soap and water. Get medical attention if irritation persists.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Ingestion: Do not induce vomiting. Slowly dilute with 1-2 glasses of water or milk and seek medical attention. Never give anything by mouth to an unconscious person.

Notes to Physician: Not Applicable
5. FIRE FIGHTING MEASURES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point/Range (F):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Flash Point/Range (C):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Flash Point Method:</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Autoignition Temperature (F):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Autoignition Temperature (C):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Flammability Limits in Air - Lower (%):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Flammability Limits in Air - Lower (oz./ft³):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Flammability Limits in Air - Upper (%):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Flammability Limits in Air - Upper (oz./ft³):</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

**Fire Extinguishing Media**

Water fog, carbon dioxide, foam, dry chemical.

**Special Exposure Hazards**

Decomposition in fire may produce toxic gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

**Special Protective Equipment for Fire-Fighters**

Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

**NFPA Ratings:**

Health 1, Flammability 0, Reactivity 0

**HMIS Ratings:**

Health 1, Flammability 0, Reactivity 0

6. ACCIDENTAL RELEASE MEASURES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Precautionary Measures</td>
<td>Use appropriate protective equipment. Avoid creating and breathing dust. Slippery when wet.</td>
</tr>
<tr>
<td>Environmental Precautionary Measures</td>
<td>Prevent from entering sewers, waterways, or low areas.</td>
</tr>
<tr>
<td>Procedure for Cleaning / Absorption</td>
<td>Scoop up and remove.</td>
</tr>
</tbody>
</table>

7. HANDLING AND STORAGE

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling Precautions</td>
<td>Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Slippery when wet.</td>
</tr>
<tr>
<td>Storage Information</td>
<td>Store away from oxidizers. Store in a cool, dry location. Product has a shelf life of 36 months.</td>
</tr>
</tbody>
</table>

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering Controls</td>
<td>Use in a well ventilated area.</td>
</tr>
<tr>
<td>Personal Protective Equipment</td>
<td>If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.</td>
</tr>
<tr>
<td>Respiratory Protection</td>
<td>Not normally needed. But if significant exposures are possible then the following respirator is recommended: Dust/mist respirator. (N95, P2/P3)</td>
</tr>
<tr>
<td>Hand Protection</td>
<td>Normal work gloves.</td>
</tr>
</tbody>
</table>
Skin Protection
Normal work coveralls.

Eye Protection
Wear safety glasses or goggles to protect against exposure.

Other Precautions
None known.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Granules</td>
</tr>
<tr>
<td>Color</td>
<td>Off white</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>pH</td>
<td>7.75 (1%)</td>
</tr>
<tr>
<td>Specific Gravity @ 20 C (Water=1):</td>
<td>0.8-1.0</td>
</tr>
<tr>
<td>Density @ 20 C (lbs./gallon):</td>
<td>6.66-8.33</td>
</tr>
<tr>
<td>Bulk Density @ 20 C (lbs/ft³):</td>
<td>52</td>
</tr>
<tr>
<td>Boiling Point/Range (F):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Boiling Point/Range (C):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Freezing Point/Range (F):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Freezing Point/Range (C):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Vapor Pressure @ 20 C (mmHg):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Vapor Density (Air=1):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Percent Volatiles:</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Evaporation Rate (Butyl Acetate=1):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Solubility in Water (g/100ml):</td>
<td>Soluble</td>
</tr>
<tr>
<td>Solubility in Solvents (g/100ml):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>VOCs (lbs./gallon):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Viscosity, Dynamic @ 20 C (centipoise):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Viscosity, Kinematic @ 20 C (centistokes):</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Partition Coefficient/n-Octanol/Water:</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Molecular Weight (g/mole):</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability Data: Stable
Hazardous Polymerization: Will Not Occur
Conditions to Avoid None anticipated
Incompatibility (Materials to Avoid) Strong oxidizers.
Additional Guidelines Not Applicable

11. TOXICOLOGICAL INFORMATION

Principle Route of Exposure Eye or skin contact, inhalation.

Symptoms related to exposure
Acute Toxicity

Inhalation None known,
Eye Contact May cause mild eye irritation.
Skin Contact May cause mild skin irritation.
Ingestion
None known

Chronic Effects/Carcinogenicity
No data available to indicate product or components present at greater than 1% are chronic health hazards.

### Toxicology data for the components

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances</td>
<td>Mixture</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

### 12. ECOLOGICAL INFORMATION

#### Ecotoxicological Information

**Ecotoxicity Product**
- **Acute Fish Toxicity:** TLM96: >1000 mg/l (Pimephales promelas)
- **Acute Crustaceans Toxicity:** Not determined
- **Acute Algae Toxicity:** EC50: > 500 mg/l (Selenastrum capricornutum)

### Ecotoxicity Substance

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Daphnia Magna (Water Flea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances</td>
<td>Mixture</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### 12.2 Persistence and degradability
Not readily biodegradable

#### 12.3 Bioaccumulative potential
Does not bioaccumulate

#### 12.4 Mobility in soil
No information available

#### 12.5 Results of PBT and vPvB assessment
No information available.

#### 12.6 Other adverse effects

### 13. DISPOSAL CONSIDERATIONS

**Disposal Method**
Disposal should be made in accordance with federal, state, and local regulations.

**Contaminated Packaging**
Follow all applicable national or local regulations.

### 14. TRANSPORT INFORMATION

#### Land Transportation

**DOT**
Not restricted

**Canadian TDG**
Not restricted
ADR
Not restricted

Air Transportation

ICAO/IATA
Not restricted

Sea Transportation

IMDG
Not restricted

Other Transportation Information

Labels: None

15. REGULATORY INFORMATION

US Regulations

US TSCA Inventory All components listed on inventory or are exempt.

EPA SARA Title III Extremely Hazardous Substances Not applicable

EPA SARA (311,312) Hazard Class None

EPA SARA (313) Chemicals This product does not contain a toxic chemical for routine annual "Toxic Chemical Release Reporting" under Section 313 (40 CFR 372).

EPA CERCLA/Superfund Reportable Spill Quantity Not applicable.

EPA RCRA Hazardous Waste Classification If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 The California Proposition 65 regulations apply to this product.

MA Right-to-Know Law One or more components listed.

NJ Right-to-Know Law One or more components listed.

PA Right-to-Know Law One or more components listed.

Canadian Regulations

Canadian DSL Inventory All components listed on inventory or are exempt.

WHMIS Hazard Class Un-Controlled

16. OTHER INFORMATION

The following sections have been revised since the last issue of this SDS
Not applicable
Additional Information

For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Compliance at 1-580-251-4335.

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***END OF MSDS***
SAFETY DATA SHEET

Product Trade Name: POLYSELECT POWER PAC™-L

Revision Date: 21-Sep-2017
Revision Number: 3

1. Identification

1.1. Product Identifier

Product Trade Name: POLYSELECT POWER PAC™-L
Synonyms: None
Chemical Family: Carbohydrate
Internal ID Code: HM008156

1.2. Recommended use and restrictions on use

Application: Fluid Loss Additive
Uses advised against: Consumer use

1.3. Manufacturer’s Name and Contact Details

Manufacturer/Supplier
BENTONITE Performance Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032
Telephone: (281) 871-7900

BENTONITE Performance Minerals LLC
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

Prepared By
Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:

Emergency Telephone Number
1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1. Classification in accordance with paragraph (d) of §1910.1200

Combustible dust

2.2. Label Elements

Hazard Pictograms

Signal Word: Warning

Hazard Statements
May form combustible dust concentrations in air.
Precautionary Statements

Prevention
Response
Storage
Disposal

2.3 Hazards not otherwise classified
None known

3. Composition/information on Ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>60 - 100%</td>
<td>Combustible Dust</td>
</tr>
</tbody>
</table>

The specific chemical identity of the composition has been withheld as proprietary. The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

**Inhalation**
If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

**Eyes**
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

**Skin**
Wash with soap and water. Get medical attention if irritation persists.

**Ingestion**
Rinse mouth with water many times. Get medical attention if symptoms occur

4.2 Most important symptoms/effects, acute and delayed

May cause mild eye, skin, and respiratory irritation.

4.3. Indication of any immediate medical attention and special treatment needed

**Notes to Physician**
Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

**Suitable Extinguishing Media**
Water fog, carbon dioxide, foam, dry chemical.

**Extinguishing media which must not be used for safety reasons**
None known.

5.2 Specific hazards arising from the substance or mixture

**Special exposure hazards in a fire**
Decomposition in fire may produce harmful gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

5.3 Special protective equipment and precautions for fire-fighters

**Special protective equipment for firefighters**
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid creating and breathing dust. Ensure adequate ventilation. Avoid contact
with skin, eyes and clothing.
See Section 8 for additional information

6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up
Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling
Handling Precautions
Avoid creating or inhaling dust. Avoid dust accumulations. Ensure adequate ventilation. Slippery when wet. Avoid
contact with eyes, skin, or clothing. Wash hands after use. Launder contaminated clothing before reuse. Use
appropriate protective equipment.
Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Storage Information
Store away from oxidizers. Store in a dry location. Product has a shelf life of 36 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>OSHA PEL-TWA</th>
<th>ACGIH TLV-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8.2 Appropriate engineering controls

Engineering Controls
A well ventilated area to control dust levels. Local exhaust ventilation should be
used in areas without good cross ventilation.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment
If engineering controls and work practices cannot prevent excessive exposures,
the selection and proper use of personal protective equipment should be
determined by an industrial hygienist or other qualified professional based on the
specific application of this product.
Respiratory Protection
Not normally needed. But if significant exposures are possible then the following
respirator is recommended:
Dust/mist respirator. (N95, P2/P3)
Hand Protection
Use gloves which are suitable for the chemicals present in this product as well as
other environmental factors in the workplace.
Skin Protection
Wear protective clothing appropriate for the work environment.
Eye Protection
Wear safety glasses or goggles to protect against exposure.
Other Precautions
None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Color</th>
<th>Odor</th>
<th>Odor/SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powder</td>
<td>White to off white</td>
<td>Odorless</td>
<td>No information available</td>
</tr>
</tbody>
</table>
### Property

**Remarks/Method**

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH:</strong></td>
<td>6.5-9 (1%)</td>
</tr>
<tr>
<td>Freezing Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>221 ºC / 430 ºF</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.6</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>400 ºC / 752 ºF</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC Content (%)</td>
<td>No data available</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>40-55 lbs/ft³</td>
</tr>
</tbody>
</table>

### 10. Stability and Reactivity

#### 10.1. Reactivity

Not expected to be reactive.

#### 10.2. Chemical stability

Stable

#### 10.3. Possibility of hazardous reactions

Will Not Occur

#### 10.4. Conditions to avoid

Keep away from heat, sparks and flame.

#### 10.5. Incompatible materials

Strong oxidizers.

#### 10.6. Hazardous decomposition products

Carbon monoxide and carbon dioxide.

### 11. Toxicological Information

#### 11.1 Information on likely routes of exposure

**Principle Route of Exposure**

Eye or skin contact, inhalation.

#### 11.2 Symptoms related to the physical, chemical and toxicological characteristics

**Acute Toxicity**
Inhalation: May cause mild respiratory irritation.
Eye Contact: May cause mild eye irritation.
Skin Contact: May cause mild skin irritation.
Ingestion: None known.

Chronic Effects/Carcinogenicity: No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components:

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral (mg/kg)</th>
<th>LD50 Dermal (mg/kg)</th>
<th>LC50 Inhalation (mg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>27000 (Rat)</td>
<td>2000 (Rabbit)</td>
<td>5800 mg/m³ (Rat) 4h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin corrosion/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>Not irritating to skin in rabbits.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Serious eye damage/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>Non-irritating to rabbit’s eye.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>Did not cause sensitization on laboratory animals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Respiratory Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mutagenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>In vitro tests did not show mutagenic effects. In vivo tests did not show mutagenic effects. (similar substances)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Carcinogenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>Did not show carcinogenic effects in animal experiments (similar substances)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Reproductive toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>Animal testing did not show any effects on fertility. Did not show teratogenic effects in animal experiments.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - single exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - repeated exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>No significant toxicity observed in animal studies at concentration requiring classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Aspiration hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

12. Ecological Information

12.1. Toxicity

Ecotoxicity effects: Product is not classified as hazardous to the environment.

Substance Ecotoxicity Data:

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>No information available</td>
<td>TLM96: 10000 ppm (Oncorhynchus mykiss) LC50 (96h) 20000 mg/L (Oncorhynchus mykiss)</td>
<td>No information available</td>
<td>EC50 (48h) 1000-3300 mg/L (Crangon crangon)</td>
</tr>
</tbody>
</table>
12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.5 Other adverse effects
No information available

13. Disposal Considerations

13.1. Waste treatment methods

Disposal methods: Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging: Follow all applicable national or local regulations.

14. Transport Information

US DOT

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Canadian TDG

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

IMDG/IMO

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

IATA/ICAO

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

Special Precautions for User: None
15. Regulatory Information

US Regulations

US TSCA Inventory

All components listed on inventory or are exempt.

<table>
<thead>
<tr>
<th>TSCA Significant New Use Rules - S5A2 Substances</th>
<th>CAS Number</th>
<th>TSCA Significant New Use Rules - S5A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
<th>CAS Number</th>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA (311,312) Hazard Class

None

EPA SARA (313) Chemicals

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxic Release Inventory (TRI) - Group I</th>
<th>Toxic Release Inventory (TRI) - Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA CERCLA/Superfund Reportable Spill Quantity

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>CERCLA RQ</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Not applicable</td>
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</tbody>
</table>

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
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<td>Not applicable</td>
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</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>MA Right-to-Know Law</th>
<th>NJ Right-to-Know Law</th>
<th>PA Right-to-Know Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polysaccharide</td>
<td>Proprietary</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

NFPA Ratings:

Health 1, Flammability 1, Reactivity 0

HMIS Ratings:

Health 1, Flammability 1, Physical Hazard 0, PPE: B

Canadian Regulations

Canadian Domestic Substances

All components listed on inventory or are exempt.

List (DSL)

16. Other information

Preparation Information

Prepared By

Chemical Stewardship

Telephone: 1-281-871-6107

e-mail: fdunexchem@halliburton.com

Revision Date:

21-Sep-2017

Reason for Revision

Name change
Additional information
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m³ – milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data
www.ChemADVISOR.com/
NZ CCID

Disclaimer Statement
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet
SAFETY DATA SHEET

Product Trade Name: POLYSELECT™ POWER SWELL

Revision Date: 30-Aug-2018
Revision Number: 1

1. Identification

1.1. Product Identifier
Product Trade Name: POLYSELECT™ POWER SWELL
Synonyms: None
Chemical Family: Polymer
Internal ID Code: HM008925

1.2 Recommended use and restrictions on use
Application: Lost Circulation Material
Uses advised against: No information available

1.3 Manufacturer’s Name and Contact Details
Manufacturer/Supplier
Baroid Fluid Services
Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000

Baroid Fluid Services
Product Service Line of Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada
Telephone: 1-403-231-9300

Prepared By
Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:
Emergency Telephone Number 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200
As adopted by the competent authority, this product does not require an SDS or hazard warning label.

Not classified

2.2. Label Elements
Hazard Pictograms
Signal Word: Not Classified
Hazard Statements
Not Hazardous

Precautionary Statements

Prevention None
Response None
Storage None
Disposal None

2.3 Hazards not otherwise classified
None known

3. Composition/information on Ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>60 - 100%</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin Wash with soap and water. Get medical attention if irritation persists.

Ingestion Under normal conditions, first aid procedures are not required.

4.2 Most important symptoms/effects, acute and delayed
No significant hazards expected.

4.3. Indication of any immediate medical attention and special treatment needed
Notes to Physician Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media
Suitable Extinguishing Media Carbon dioxide, dry chemical, foam.

Extinguishing media which must not be used for safety reasons None known.

5.2 Specific hazards arising from the substance or mixture
Special exposure hazards in a fire Decomposition in fire may produce harmful gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

5.3 Special protective equipment and precautions for fire-fighters
Special protective equipment for firefighters Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid creating and breathing dust. Slippery when wet. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation.
See Section 8 for additional information

6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up
Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling
Handling Precautions
Avoid creating or inhaling dust. Ensure adequate ventilation. Avoid contact with eyes, skin, or clothing. Wash hands after use. Launder contaminated clothing before reuse. Slippery when wet. Use appropriate protective equipment.
Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Storage Information
Store away from oxidizers. Store in a dry location. Product has a shelf life of 24 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>OSHA PEL-TWA</th>
<th>ACGIH TLV-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8.2 Appropriate engineering controls
Engineering Controls
A well ventilated area to control dust levels.

8.3 Individual protection measures, such as personal protective equipment

<table>
<thead>
<tr>
<th>Personal Protective Equipment</th>
<th>If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Protection</td>
<td>Not normally needed. But if significant exposures are possible then the following respirator is recommended: Dust/mist respirator. (N95, P2/P3)</td>
</tr>
<tr>
<td>Hand Protection</td>
<td>Normal work gloves.</td>
</tr>
<tr>
<td>Skin Protection</td>
<td>Normal work coveralls.</td>
</tr>
<tr>
<td>Eye Protection</td>
<td>Wear safety glasses or goggles to protect against exposure.</td>
</tr>
<tr>
<td>Other Precautions</td>
<td>None known.</td>
</tr>
</tbody>
</table>

9. Physical and Chemical Properties
9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>4-11</td>
</tr>
<tr>
<td>Freezing Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.4</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Insoluble in water</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOC Content (%)</td>
<td>No data available</td>
</tr>
<tr>
<td>Bulk Density</td>
<td>40-50 lbs/ft3</td>
</tr>
</tbody>
</table>

10. Stability and Reactivity

10.1. Reactivity
Not expected to be reactive.

10.2. Chemical stability
Stable

10.3. Possibility of hazardous reactions
Will Not Occur

10.4. Conditions to avoid
None anticipated

10.5. Incompatible materials
Strong oxidizers.

10.6. Hazardous decomposition products
Oxides of nitrogen. Ammonia. Hydrocarbons. Carbon monoxide and carbon dioxide. In the event of oxygen depletion, hydrocyanic acid can be formed.

11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure Eye or skin contact, inhalation.
11.2 Symptoms related to the physical, chemical and toxicological characteristics

**Acute Toxicity**

**Inhalation**
May cause mild respiratory irritation.

**Eye Contact**
May cause mild eye irritation.

**Skin Contact**
May cause mild skin irritation.

**Ingestion**
May cause abdominal pain, vomiting, nausea, and diarrhea.

**Chronic Effects/Carcinogenicity**
No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

**Toxicology data for the components**

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

12. Ecological Information

12.1. Toxicity

**Substance Ecotoxicity Data**

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
</tr>
</tbody>
</table>
12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mobility</th>
</tr>
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<tbody>
<tr>
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<td>No information available</td>
</tr>
</tbody>
</table>

12.5 Other adverse effects
No information available

13. Disposal Considerations

13.1. Waste treatment methods

Disposal methods: Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging: Follow all applicable national or local regulations.

14. Transport Information

US DOT

- UN Number: Not restricted
- UN proper shipping name: Not restricted
- Transport Hazard Class(es): Not applicable
- Packing Group: Not applicable
- Environmental Hazards: Not applicable

Canadian TDG

- UN Number: Not restricted
- UN proper shipping name: Not restricted
- Transport Hazard Class(es): Not applicable
- Packing Group: Not applicable
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IMDG/IMO

- UN Number: Not restricted
- UN proper shipping name: Not restricted
- Transport Hazard Class(es): Not applicable
- Packing Group: Not applicable
- Environmental Hazards: Not applicable

IATA/ICAO

- UN Number: Not restricted
- UN proper shipping name: Not restricted
- Transport Hazard Class(es): Not applicable
- Packing Group: Not applicable
- Environmental Hazards: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable
Special Precautions for User: None

15. Regulatory Information

US Regulations

US TSCA Inventory: All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2
POLYSELECT™ POWER SWELL

Substances | CAS Number | TSCA Significant New Use Rules - S5A2
--- | --- | ---
Contains no hazardous substances in concentrations above cut-off values according to the competent authority | NA | Not applicable

### EPA SARA Title III Extremely Hazardous Substances

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
</tr>
</thead>
<tbody>
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<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
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<td>Not applicable</td>
</tr>
</tbody>
</table>

### EPA SARA (311,312) Hazard Class

None

### EPA SARA (313) Chemicals

<table>
<thead>
<tr>
<th>Substances</th>
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<th>Toxic Release Inventory (TRI) - Group I</th>
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### EPA CERCLA/Superfund Reportable Spill Quantity

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</tbody>
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### EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

### California Proposition 65

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### U.S. State Right-to-Know Regulations

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<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### NFPA Ratings: Health 1, Flammability 1, Reactivity 0

### HMIS Ratings: Health 1, Flammability 1, Reactivity 0

### Canadian Regulations

**Canadian Domestic Substances** All components listed on inventory or are exempt.

**List (DSL)**

### 16. Other information

**Preparation Information**

Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 30-Aug-2018
Reason for Revision
Initial Release

Additional information
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m³ - milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data
www.ChemADVISOR.com/

Disclaimer Statement
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet
1. Identification

1.1. Product Identifier

Product Trade Name: POLYSELECT™ POWER THIN
Synonyms: None
Chemical Family: Blend
Internal ID Code: HM008886

1.2. Recommended use and restrictions on use

Application: Additive
Uses advised against: No information available

1.3. Manufacturer's Name and Contact Details

Manufacturer/Supplier
Baroid Fluid Services
Product Service Line of Halliburton Energy Services, Inc.
P.O. Box 1675
Houston, TX 77251
Telephone: (281) 871-4000

Baroid Fluid Services
Product Service Line of Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada
Telephone: 1-403-231-9300

Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:

Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1. Classification in accordance with paragraph (d) of §1910.1200

As adopted by the competent authority, this product does not require an SDS or hazard warning label.

Not classified

2.2. Label Elements

Hazard Pictograms

Signal Word: Not Classified
Hazard Statements

Not Hazardous

Precautionary Statements

Prevention
None
Response
None
Storage
None
Disposal
None

2.3 Hazards not otherwise classified
None known

3. Composition/information on Ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>60 - 100%</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures
Inhalation
If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.
Eyes
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Skin
Wash with soap and water. Get medical attention if irritation persists.
Ingestion
Rinse mouth with water many times. Get medical attention, if symptoms occur

4.2 Most important symptoms/effects, acute and delayed
No significant hazards expected.

4.3. Indication of any immediate medical attention and special treatment needed
Notes to Physician
Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media
Suitable Extinguishing Media
Water fog, carbon dioxide, foam, dry chemical.
Extinguishing media which must not be used for safety reasons
None known.

5.2 Specific hazards arising from the substance or mixture
Special exposure hazards in a fire
Decomposition in fire may produce harmful gases. Spills produce extremely slippery surfaces.

5.3 Special protective equipment and precautions for fire-fighters
Special protective equipment for firefighters
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.
6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Spills of this product are very slippery. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Ensure adequate ventilation.
See Section 8 for additional information

6.2. Environmental precautions
None known.

6.3. Methods and material for containment and cleaning up
Isolate spill and stop leak where safe. Contain spill with sand or other inert materials. Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling
Handling Precautions
Avoid contact with eyes, skin, or clothing. Wash hands after use. Avoid breathing vapors. Ensure adequate ventilation. Use appropriate protective equipment.
Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Storage Information
Store away from oxidizers. Store in a cool, dry location. Product has a shelf life of 24 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>OSHA PEL-TWA</th>
<th>ACGIH TLV-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8.2 Appropriate engineering controls

Engineering Controls
Use in a well ventilated area.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment
If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection
If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.

Hand Protection
Use gloves which are suitable for the chemicals present in this product as well as other environmental factors in the workplace.

Skin Protection
Wear protective clothing appropriate for the work environment.

Eye Protection
Safety glasses with side-shields. If splashes are likely to occur, wear: Goggles,
Other Precautions

Face-shield.
None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight</td>
</tr>
<tr>
<td>Color</td>
<td>Yellowish</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>7 - 9</td>
</tr>
<tr>
<td>Freezing Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Pour Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling Point / Range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>&gt; 100 °C / &gt; 212 °F Cleveland Open Cup (COC)</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.16</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

9.2. Other information

VOC Content (%)                  | No data available                                                      |

10. Stability and Reactivity

10.1. Reactivity
Not expected to be reactive.

10.2. Chemical stability
Stable

10.3. Possibility of hazardous reactions
Will Not Occur

10.4. Conditions to avoid
None anticipated

10.5. Incompatible materials
Strong oxidizers.

10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide.
11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure  Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity

- **Inhalation**: May cause mild respiratory irritation.
- **Eye Contact**: May cause mild eye irritation.
- **Skin Contact**: May cause mild skin irritation.
- **Ingestion**: May cause abdominal pain, vomiting, nausea, and diarrhea.

Chronic Effects/Carcinogenicity  No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No data available</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

12. Ecological Information

12.1. Toxicity

Ecotoxicity effects
Product is not classified as hazardous to the environment.

**Substance Ecotoxicity Data**

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
</tr>
</tbody>
</table>
12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.5 Other adverse effects
No information available

13. Disposal Considerations

13.1. Waste treatment methods
Disposal methods
Disposal should be made in accordance with federal, state, and local regulations.

Contaminated Packaging
Follow all applicable national or local regulations.

14. Transport Information

US DOT

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Canadian TDG

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

IMDG/IMO

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

IATA/ICAO

<table>
<thead>
<tr>
<th>UN Number</th>
<th>UN proper shipping name:</th>
<th>Transport Hazard Class(es):</th>
<th>Packing Group:</th>
<th>Environmental Hazards:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not restricted</td>
<td>Not restricted</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable
Special Precautions for User: None
15. Regulatory Information

US Regulations

US TSCA Inventory  All components listed on inventory or are exempt.

### TSCA Significant New Use Rules - S5A2

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>TSCA Significant New Use Rules - S5A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### EPA SARA Title III Extremely Hazardous Substances

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### EPA SARA (311,312) Hazard Class

None

### EPA SARA (313) Chemicals

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxic Release Inventory (TRI) - Group I</th>
<th>Toxic Release Inventory (TRI) - Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### EPA CERCLA/Superfund Reportable Spill Quantity

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>CERCLA RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

### California Proposition 65

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>MA Right-to-Know Law</th>
<th>NJ Right-to-Know Law</th>
<th>PA Right-to-Know Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contains no hazardous substances in concentrations above cut-off values according to the competent authority</td>
<td>NA</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### NFPA Ratings:

Health 1, Flammability 1, Reactivity 0

### HMIS Ratings:

Health 1, Flammability 0, Physical Hazard 0, PPE: B

### Canadian Regulations

#### Canadian Domestic Substances
All components listed on inventory or are exempt.

List (DSL)

16. Other information
Preparation Information
Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 17-Jan-2019

Reason for Revision: SDS sections updated:
9
Change to physical properties

Additional information
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet
bw – body weight
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NIOSH – National Institute for Occupational Safety and Health
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OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data
www.ChemADVISOR.com/
NZ CCID

Disclaimer Statement
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End of Safety Data Sheet
SAFETY DATA SHEET
POLYSELECT POWER XAN

1. Identification

1.1. Product Identifier
Product Trade Name: POLYSELECT POWER XAN
Synonyms: None
Chemical Family: Polysaccharide
Internal ID Code: HM008134

1.2 Recommended use and restrictions on use
Application: Viscosifier
Uses advised against: No information available

1.3 Manufacturer's Name and Contact Details
Manufacturer/Supplier:
BENTONITE Performance Minerals LLC
3000 N Sam Houston Parkway East
Houston, TX 77032
Telephone: (281) 871-7900

Halliburton Energy Services, Inc.
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada
Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number:
Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

| Combustible dust | Combustible dust |

2.2. Label Elements

Hazard Pictograms

Signal Word: Warning

Hazard Statements: May form combustible dust concentrations in air.
Precautionary Statements

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Response</th>
<th>Storage</th>
<th>Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

2.3 Hazards not otherwise classified
None known

3. Composition/information on Ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>60 - 100%</td>
<td>Combustible Dust</td>
</tr>
</tbody>
</table>

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation: If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin: Wash with soap and water. Get medical attention if irritation persists.

Ingestion: Under normal conditions, first aid procedures are not required.

4.2 Most important symptoms/effects, acute and delayed
No significant hazards expected.

4.3. Indication of any immediate medical attention and special treatment needed
Notes to Physician: Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media
Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons
None known.

5.2 Specific hazards arising from the substance or mixture

Special exposure hazards in a fire
Decomposition in fire may produce harmful gases. Organic dust in the presence of an ignition source can be explosive in high concentrations. Good housekeeping practices are required to minimize this potential.

5.3 Special protective equipment and precautions for fire-fighters

Special protective equipment for firefighters
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. See Section 8 for additional information

6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up
Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling
Handling Precautions
Slippery when wet. Avoid creating or inhaling dust. Avoid contact with eyes, skin, or clothing. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Storage Information
Store away from oxidizers. Store in a cool, dry location. Product has a shelf life of 24 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Substances</th>
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<th>OSHA PEL-TWA</th>
<th>ACGIH TLV-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8.2 Appropriate engineering controls

Engineering Controls
Use in a well ventilated area.

8.3 Individual protection measures, such as personal protective equipment

Personal Protective Equipment
If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection
Not normally needed. But if significant exposures are possible then the following respirator is recommended:
Dust/mist respirator. (N95, P2/P3)

Hand Protection
Normal work gloves.

Skin Protection
Normal work coveralls.

Eye Protection
Wear safety glasses or goggles to protect against exposure.

Other Precautions
None known.

9. Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Powder</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight</td>
</tr>
<tr>
<td>Color</td>
<td>White to off white</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>Remarks/ - Method</td>
<td></td>
</tr>
</tbody>
</table>
pH: 7 (1%)

Freezing Point / Range
No data available

Melting Point / Range
No data available

Boiling Point / Range
No data available

Flash Point
No data available

Flammability (solid, gas)
No data available
  Upper flammability limit
  Lower flammability limit

Evaporation rate
No data available

Vapor Pressure
No data available

Vapor Density
No data available

Specific Gravity
1.6

Water Solubility
Soluble in water

Solubility in other solvents
No data available

Partition coefficient: n-octanol/water
No data available

Autoignition Temperature
204 °C / 400 °F

Decomposition Temperature
No data available

Viscosity
No data available

Explosive Properties
No information available

Oxidizing Properties
No information available

9.2. Other information
Molecular Weight
1000000

VOC Content (%)
No data available

Bulk Density
52.4 lbs/ft3

10. Stability and Reactivity

10.1. Reactivity
Not expected to be reactive.

10.2. Chemical stability
Stable

10.3. Possibility of hazardous reactions
Will Not Occur

10.4. Conditions to avoid
None anticipated

10.5. Incompatible materials
Strong oxidizers.

10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide.

11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics
Acute Toxicity
  Inhalation May cause mild respiratory irritation.
  Eye Contact May cause mild eye irritation.
  Skin Contact May cause mild skin irritation.
Ingestion
May cause abdominal pain, vomiting, nausea, and diarrhea.

Chronic Effects/Carcinogenicity
No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>&gt; 5000 mg/kg (Rat)</td>
<td>No data available</td>
<td>&gt; 21 mg/L (Rat) 1h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; 45000 mg/kg (Rat)</td>
<td></td>
<td>&gt; 4.25 mg/L (Rat) 4h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin corrosion/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not irritating to skin in rabbits.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Serious eye damage/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Non-irritating to rabbit's eye</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Did not cause sensitization on laboratory animals (guinea pig)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Respiratory Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No sensitization responses were observed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mutagenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Carcinogenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Did not show carcinogenic effects in animal experiments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Reproductive toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Animal testing did not show any effects on fertility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - single exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No significant toxicity observed in animal studies at concentration requiring classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - repeated exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No significant toxicity observed in animal studies at concentration requiring classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Aspiration hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

12. Ecological Information

12.1. Toxicity

Substance Ecotoxicity Data

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No information available</td>
<td>TLM96 320-560 ppm (Oncorhynchus mykiss)</td>
<td>LC50 (96h) 490 mg/L (Oncorhynchus mykiss)</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Biodegradable.</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential
<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No information available</td>
</tr>
</tbody>
</table>

### 12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>No information available</td>
</tr>
</tbody>
</table>

### 12.5 Other adverse effects

No information available

### 13. Disposal Considerations

#### 13.1. Waste treatment methods

- **Disposal methods**: Bury in a licensed landfill according to federal, state, and local regulations.
- **Contaminated Packaging**: Follow all applicable national or local regulations.

### 14. Transport Information

#### US DOT

- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
- **Transport Hazard Class(es)**: Not applicable
- **Packing Group**: Not applicable
- **Environmental Hazards**: Not applicable

#### Canadian TDG

- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
- **Transport Hazard Class(es)**: Not applicable
- **Packing Group**: Not applicable
- **Environmental Hazards**: Not applicable

#### IMDG/IMO

- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
- **Transport Hazard Class(es)**: Not applicable
- **Packing Group**: Not applicable
- **Environmental Hazards**: Not applicable

#### IATA/ICAO

- **UN Number**: Not restricted
- **UN proper shipping name**: Not restricted
- **Transport Hazard Class(es)**: Not applicable
- **Packing Group**: Not applicable
- **Environmental Hazards**: Not applicable

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**: Not applicable

**Special Precautions for User**: None

### 15. Regulatory Information

#### US Regulations

**US TSCA Inventory**: All components listed on inventory or are exempt.
TSCA Significant New Use Rules - S5A2

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>TSCA Significant New Use Rules - S5A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA Title III Extremely Hazardous Substances

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA (311,312) Hazard Class
None

EPA SARA (313) Chemicals

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxic Release Inventory (TRI) - Group I</th>
<th>Toxic Release Inventory (TRI) - Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA CERCLA/Superfund Reportable Spill Quantity

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>CERCLA RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA RCRA Hazardous Waste Classification

If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>California Proposition 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>MA Right-to-Know Law</th>
<th>NJ Right-to-Know Law</th>
<th>PA Right-to-Know Law</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xanthan gum</td>
<td>11138-66-2</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

NFPA Ratings: Health 1, Flammability 1, Reactivity 0
HMIS Ratings: Health 1, Flammability 1, Physical Hazard 0, PPE: B

Canadian Regulations

Canadian Domestic Substances  All components listed on inventory or are exempt. List (DSL)

16. Other information

Preparation Information
Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 21-Sep-2017

Reason for Revision: Name change

Additional information
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m$^3$ – milligram/cubic meter
mm - millimeter
mmHg - millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w - weight/weight

Key literature references and sources for data
www.ChemADVISOR.com/
NZ CCID
WHO/FAO

Disclaimer Statement
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet
1. Identification

1.1. Product identifier
Product Identity Star-Plex
Alternate Names N/A

1.2. Relevant identified uses of the substance or mixture and application method
Intended use Drilling Fluid Additive
Application Method See Technical Data Sheet.

1.3. Details of the supplier of the safety data sheet
Company Name NorthStar Fluid Solutions
P.O. Box 271036
Louisville, Colorado 80027, USA
Emergency CHEMTREC (USA) (800) 424-9300
24 hour Emergency Telephone No. International +1-703-527-3887
Customer Service: NorthStar Fluid Solutions (303) 495-3130

2. Hazard(s) identification

2.1 Classification of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word Warning
Hazard Statement(s) May form combustible dust concentrations in air
Precautionary statement(s) P234- Keep only in original container.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS

Combustible dust
3. Composition/information on ingredients

3.1 Substance
Synonyms: Poly Hydroxy Silicate

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium compound</td>
<td>Proprietary</td>
<td>Proprietary</td>
<td>Combustible dust</td>
</tr>
<tr>
<td>Sodium compound</td>
<td>Proprietary</td>
<td>Proprietary</td>
<td>Combustible dust</td>
</tr>
<tr>
<td>Aluminum compound</td>
<td>Proprietary</td>
<td>Proprietary</td>
<td>Combustible dust</td>
</tr>
</tbody>
</table>

In accordance with paragraph (i) of §1910.1200, the specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

[1] Substance classified with a health or environmental hazard.

*The full texts of the phrases are shown in Section 16.

4. First aid measures

4.1. Description of first aid measures
General Consult a physician. Show this safety data sheet to the doctor in attendance.
Inhalation Remove victim to fresh air. Consult medical personnel.
Eyes Immediately flush with plenty of water for at least 15 minutes. Get medical attention.
Skin Wash off with soap and plenty of water. Consult a physician.
Ingestion Flush oral cavity and give one or two glasses of water to drink. If gastrointestinal symptoms develop, consult medical personnel. (Never give anything by mouth to an unconscious person).

4.2. Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.

4.3 Indication of any immediate medical attention and special treatment needed
Product may irritate eyes, skin, mucous membranes and upper respiratory tract with overexposure. Prolonged inhalation (chronic) of dust may result in lung damage.

5. Fire-fighting measures

5.1. Extinguishing media
Suitable for all regular extinguishing materials. Do not use high pressure water jet.

5.2. Special hazards arising from the substance or mixture
Nature of decomposition products not known.

5.3. Advice for fire-fighters
Wear self-contained breathing apparatus for firefighting if necessary.
6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Avoid creating dust. Use MSHA-NIOSH approved respirator for dusts, mists and fumes whose TLV is greater than 0.05 mg/m³. Avoid breathing vapors, mist, or gas. For personal protection see section 8.

6.2. Environmental precautions
None known.

6.3. Methods and material for containment and cleaning up
Prevent discharges to streams or sewer systems. Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable close containers for disposal.

6.4 Neutralizing Chemicals
Dilute Acid.

7. Handling and storage

7.1. Precautions for safe handling
Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2. Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.
Air and moisture sensitive. Keep in a dry place. Storage class (TRGS 510): Non Combustible Solids

7.3. Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

8. Exposure controls and personal protection

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Ingredient</th>
<th>Source</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proprietary</td>
<td>Magnesium compound</td>
<td>OSHA TLV</td>
<td>15 mg/m³ TWA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Table 2 limits for air contaminants</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACGIH TLV</td>
<td>10 mg/m³ TWA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Remarks</td>
<td>Upper respiratory tract irritation metal fume fever not classifiable as a human carcinogen</td>
</tr>
<tr>
<td>Proprietary</td>
<td>Sodium compound</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Proprietary</td>
<td>Aluminum compound</td>
<td>OSHA PEL</td>
<td>15 mg/m³ TWA Total</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OSHA PEL</td>
<td>5 mg/m³ TWA Respirable (Al)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ACGIH TLV</td>
<td>10 mg/m³ TWA Al</td>
</tr>
</tbody>
</table>
8.2. Exposure controls

Respiratory  Reparatory protection is not required. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Eyes  Use chemical splash goggles and face shield. Eye protection worn must be compatible with respiratory protection system employed.

Skin  Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Engineering Controls  Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Other Work Practices  Where splash is possible, full chemically resistant protective clothing and boots are required. Ensure that eyewash stations and safety showers are proximal to the work-station location. Do not let product enter drains.

See section 2 for further details. - [Prevention]:

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid, powder. White to Off-White</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>10.9-11.9</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>&gt; 500 C</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not known</td>
</tr>
<tr>
<td>Evaporation rate (Ether = 1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Carbon monoxide and carbon dioxide may form on combustion.</td>
</tr>
<tr>
<td>Upper/lower flammability or explosive limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor pressure (Pa)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>No data available</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Partition coefficient n-octanol/water (Log Kow)</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>Not known</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity (cSt)</td>
<td>No data available</td>
</tr>
<tr>
<td>Density (lbs/gal)</td>
<td>No data available</td>
</tr>
</tbody>
</table>

9.2. Other information

No data available
10. Stability and reactivity

10.1. Reactivity
No data available

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
No data available.

10.4. Conditions to avoid
Mixture with strong acids produces considerable heat.

10.5. Incompatible materials
Avoid contact with the following: copper, tin, zinc, aluminum, and their alloys.

10.6. Hazardous decomposition products
Will not occur. In the event of fire: see section 5.

11. Toxicological information

11.1 Information on toxicological effects

Acute Toxicity
Inhalation
No data available

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present as levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Reproductive toxicity
No data available

Specific target organ toxicity-single exposure
No data available

Specific target organ toxicity-repeated exposure
No data available

Aspiration hazard
No data available

Additional Information
Ingestion or inhalation of large quantity may cause feverish reaction and leukocytosis-diarrhea. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

12. Ecological information

12.1. Aquatic Toxicity
Please contact our office for the most up to date information.

12.2. Persistence and degradability
No data available

12.3. Bioaccumulative potential
No data available

12.4. Mobility in soil
No data available

12.5. Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/ not conducted

12.6. Other adverse effects
When released into the soil, this material is not expected to biodegrade and may leach into groundwater.

13. Disposal considerations

13.1. Waste treatment methods

Methods Product
Do not allow residue to flow into drainage system. Waste disposal according to regulations of responsible local authority.

Contaminated packaging
Waste disposal according to regulations of responsible local authority.
14. Transport information

**DOT (US)**
Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA

**IMDG**
Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA

**IATA**
Not regulated for transportation by DOT, TDG, IMDG, ICAO/IATA

15. Regulatory information

**SARA 302 Components**
None. If no components are listed below, this product is not subject to the referenced SARA and regulations.

**SARA 313 Components**
None. If no components are listed below, this product is not subject to the referenced SARA and regulations.

**SARA 311/312 HAZARDS**
Delayed/ Chronic Health Hazard

**Massachusetts Right To Know Components**
Does not apply.

**Pennsylvania Right To Know Components**
Does not apply.

**New Jersey Right to Know Components**
Does not apply.
16. Other information

This is the first version in the GHS SDS format. Listings of changes from previous versions in other formats are not applicable.

The information and data herein are believed to be accurate and have been compiled from sources believed to be reliable. It is offered for your consideration, investigation and verification. Buyer assumes all risk of use, storage and handling of the product in compliance with applicable Federal, State and local law and regulations. NorthStar Fluid Solutions makes no warranty of any kind, express or implied, concerning the accuracy of completeness of the information and data herein. The implied warranties of merchantability and fitness for a particular purpose are specifically excluded. NorthStar Fluid Solutions will not be liable for claims relating to any use of this product.

Emergency Overview:

Risk Classification System:

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEALTH</td>
<td>1</td>
</tr>
<tr>
<td>FLAMMABILITY</td>
<td>0</td>
</tr>
<tr>
<td>PHYSICAL</td>
<td>0</td>
</tr>
<tr>
<td>PPE</td>
<td>E</td>
</tr>
</tbody>
</table>

End of Document
1. Product and Company Identification

Product Code: 0003
Product Name: Lubra-Star Plus
Trade Name: Water Soluble Lubricant
Company Name: NorthStar Fluid Solutions
PO Box 271036
Louisville, CO 80027

Web site address: www.northstarfluids.com
Emergency Contact: ChemTrec
                    International
                    Phone Number:
                    (303)495-3130
                    1 (800)424-9300
                    1 (703)527-3887

2. Hazards Identification

Emergency Overview:
Product may be irritating to eyes, skin
Eyes: May cause slight irritation to the eyes. Contact with hot or molten material can cause severe thermal burns.
Skin: May be irritating to the skin. Contact with hot or molten material can cause severe thermal burns.
Ingestion: Not anticipated route or exposure. Not expected to be orally toxic.
Inhalations: No adverse effects expected in normal industrial use

Hazard Rating System:

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FLAMMABILITY</th>
<th>INSTABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Potential Health Effects
(Acute and Chronic):
None known. The components of this product are not known to cause target organ effects. Not listed as a carcinogen by IARC, NTP or OSHA

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>(Trade Secret)</td>
<td>0.0 -100.0 %</td>
</tr>
</tbody>
</table>

4. First Aid Measures

Emergency and First Aid Procedures:
Remove person to fresh air. Get medical attention for any breathing difficulty.

In Case of Inhalation:
Wash exposed area with soap and water. Remove contaminated clothing and wash before reuse. Get medical attention if irritated develops. For hot or molten product, immediately immerse and/or flush area with large amounts of cold water. Cover with clean cotton sheeting or gauze and get prompt medical attention.

In Case of Skin Contact:
Remove contact lenses if worn. Flush thoroughly with large amounts of running water for at least 15 minutes. Get medical attention if irritations develops.

In Case of Eye Contact:
If person is conscious, immediately rinse mouth and give large quantities of water to drink. Get immediate medical attention. Never give anything by mouth to an unconscious person.
5. Fire Fighting Measures

Flash Pt: > 206.00 F
Explosive Limits: LEL: No data. UEL: No data.
Autoignition Pt: No data.
Suitable Extinguishing Media: Carbon dioxide, dry chemical or regular foam.
Fire Fighting Instructions: Evacuate all unnecessary personal. Wear self contained breathing apparatus and protection for skin. Mixing water with hot molten product may cause violent splattering due to rapid steam generation.
Flammable Properties and Hazards: No data available.

6. Accidental Release Measures

Protective Precautions, Protective Equipment and Emergency Procedures: Wear appropriate protective clothing to prevent skin exposure.
Steps To Be Taken In Case Material Is Released Or Spilled: Stop leak if you can do so without risk. Contain, collect by absorbing on sand, sawdust or other available solids and place in suitable container for reuse or disposal.

7. Handling and Storage

Precautions To Be Taken in Handling: Handle only in well ventilated area. Avoid eye contact. Avoid repeated or prolonged skin contact. Use appropriate protective equipment. Unvented containers may develop pressure. Open with caution. Wash thoroughly after handling. Eyewash stations and safety showers should be easily accessible to area where product is used.
Precautions To Be Taken in Storing: Store in a cool, dry, well-ventilated area away from incompatible substances. Keep containers closed when not in use. Store hot or molten material under an inert gas blanket to avoid oxidative degradation. Keep away from oxidizing agents and alkalis.

8. Exposure Controls/Personal Protection

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name (Trade Secret)</th>
<th>OSHA TWA</th>
<th>ACGIH TWA</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>Partial Chemical Name</td>
<td>No data</td>
<td>No data</td>
<td>No data</td>
</tr>
</tbody>
</table>

Respiratory Equipment (Specify Type): None required under normal conditions of use. A system of local and/or general exhaust is recommended if handled in a confined area.
Eye Protection: Safety glasses with side shields
Protective Gloves: Wear long sleeved clothing and rubber or neoprene gloves. Use heat resistant gloves for hot or molten material. As appropriate for work area.
Other Protective Clothing: As appropriate for work area.
Engineering Controls (Ventilation etc.): Not applicable.
### 9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical States:</td>
<td>[ ] Gas  [X] Liquid  [ ] Solid</td>
</tr>
<tr>
<td>Appearance and Odor:</td>
<td>Appearance: Black. Viscous. Odor: sweet</td>
</tr>
<tr>
<td>Melting Point:</td>
<td>No data.</td>
</tr>
<tr>
<td>Boiling Point:</td>
<td>&gt; 375.00 F - 190.60 C</td>
</tr>
<tr>
<td>Autoignition Pt:</td>
<td>No data.</td>
</tr>
<tr>
<td>Flash Pt:</td>
<td>&gt; 206.00 F</td>
</tr>
<tr>
<td>Explosive Limits:</td>
<td>LEL: No data.              UEL: No data.</td>
</tr>
<tr>
<td>Specific Gravity (Water = 1):</td>
<td>~ .91 - .94</td>
</tr>
<tr>
<td>Vapor Pressure (vs. Air or mm Hg):</td>
<td>No data.</td>
</tr>
<tr>
<td>Vapor Density (vs. Air = 1):</td>
<td>NA</td>
</tr>
<tr>
<td>Evaporation Rate:</td>
<td>PR</td>
</tr>
<tr>
<td>Solubility in Water:</td>
<td>No data.</td>
</tr>
<tr>
<td>pH:</td>
<td>NP</td>
</tr>
<tr>
<td>Percent Volatile:</td>
<td>No data.</td>
</tr>
</tbody>
</table>

### 10. Stability and Reactivity

| Stability                        | Unstable [ ] Stable [X] |
| Conditions To Avoid - Instability: | Stable under normal conditions of use and storage |
| Incompatibility - Materials To Avoid: | strong oxidizers, alkalis. |
| Hazardous Decomposition Or Byproducts: | oxides of sulfur |
| Possibility of Hazardous Reactions: | Will occur [ ] Will not occur [X] |
| Conditions To Avoid - Hazardous Reactions: | No data available. |

### 11. Toxicological Information

| Toxicological Information:       | No data available. |
| Chronic Toxicological Effects:   | No acute toxicity data is available for product or components. Cancer Status: not listed as carcinogen by IARC, NTP or OSHA. There are no known chronic effects from exposure to this product. |

### 12. Ecological Information

| General Ecological Information: | No information found. |
| Persistence and Degradability:  | This product is biodegradable under aerobic and anaerobic condensations |
13. Disposal Considerations

Waste Disposal Method: Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal laws and regulations. Consult state and local regulations regarding the proper disposal of this material. Any containers or equipment used should be decontaminated immediately after use.

14. Transport Information

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Non-Hazardous for Air Transport: Non-hazardous for air transport.
DOT Hazard Class:
UN/NA Number:

15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NA</td>
<td>(Trade Secret)</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

16. Other Information

Additional Information About This Product: No data available.

Company Policy or Disclaimer:

Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, NorthStar Fluid Solutions, makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the person receiving this MSDS will make own determination as to its suitability for their intended purpose prior to use. Since the product is within the exclusive control of the user, it is the user's obligation to determine the conditions of safe use of this product. Such conditions should comply with all Federal Regulations concerning the Product. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HERUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.
Lost Circulation Specialists, Inc.

Effective Date: January 1, 2010

Section 1
Product Identification

Product Name: Magma Fiber

Generic Name: Mineral Fiber

Primary Components: Vitreous fiber made from blast furnace slug and/or basalt (mixture)

Section 2
Ingredients (Not specification values)

<table>
<thead>
<tr>
<th>Materials</th>
<th>PEL (total)</th>
<th>TLV (total)</th>
<th>CAS#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral Fiber</td>
<td>15 mg/M3</td>
<td>10 mg/M3</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>5 mg/M3 (respirable)</td>
<td>5 mg/M3 (respirable)</td>
<td>Assigned</td>
</tr>
</tbody>
</table>

Section 3
Physical Data

Melting Point (F): 2400

Vapour Pressure: N/A

Specific Gravity: 2.6

Physical State: Solid

Colour and Odor: White-Gray/Tan Fiber, Low Odor

Vap Density (Air=1): N/A

Solubility in Water: Not

% Volatile by Vol: None

Section 4
Fire and Explosion Hazard Data

Flash Point (C): Non-Combustible (ASTME84)

Flammable Limits: N/A

Extinguishing Media: Non-Combustible

Fire and Explosion Hazard: None

Section 5
Reactivity Data

Stability: Stable

Conditions to Avoid: None
### Section 6

#### Health Hazard Data

<table>
<thead>
<tr>
<th>Oral Ingestion</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Contact</td>
<td>Mineral fiber may cause transitory (temporary) mechanical irritation to eyes</td>
</tr>
<tr>
<td>Skin Contact</td>
<td>Skin contact may cause transitory skin irritation and possible irritation to eyes and upper respiratory tract</td>
</tr>
<tr>
<td>Skin Absorption</td>
<td>N/A</td>
</tr>
<tr>
<td>Inhalation</td>
<td>May cause transitory irritation to upper respiratory tract when handling this product, wear a NIOSH approved dust mask or respirator, avoid creating excessive dust</td>
</tr>
<tr>
<td>IARC Group 3-</td>
<td>Not Classifiable as carcinogenicity in humans</td>
</tr>
<tr>
<td>NTP-</td>
<td>Not Classified</td>
</tr>
<tr>
<td>ACGIH-</td>
<td>Not Classified</td>
</tr>
</tbody>
</table>

#### First Aid Procedure

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Flush with water and see a physician if irritation continues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Wash fiber from skin with soap and water</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Call a physician</td>
</tr>
</tbody>
</table>

### Section 7

#### Special Protection

<table>
<thead>
<tr>
<th>Ventilation</th>
<th>Local exhaust or mechanical ventilation to keep below TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory</td>
<td>Niosh approved 3M 8710 or equivalent dust respirator is recommended</td>
</tr>
<tr>
<td>Clothing</td>
<td>Gloves if dust is irritaing, tight fitting goggles in dusty environment, wear long sleeved, loose fitting clothing closed at neck and wrists to minimize skin exposure, wash clothes separately from underwear</td>
</tr>
</tbody>
</table>
### Section 8

**Eye Protection**

To avoid eye irritation wear safety glasses or goggles

**Spill or Leak Procedure**

Steps to be taken: Normal clean-up procedures, avoid creating excessive dust

Disposal method: To landfill in accordance with local, provincial and federal regulations

### Section 9

**Special precautions or other comments**

TDG Shipping Name: Non-hazardous
SAFETY DATA SHEET

Product Trade Name: POLYSELECT™ DMD SODA ASH

Revision Date: 23-Mar-2017
Revision Number: 5

1. Identification

1.1. Product Identifier
Product Trade Name: POLYSELECT™ DMD SODA ASH
Synonyms: None
Chemical Family: Carbonate
Internal ID Code: HM008028

1.2 Recommended use and restrictions on use
Application: Buffer
Uses advised against: No information available

1.3 Manufacturer’s Name and Contact Details
Manufacturer/Supplier
Halliburton Energy Services Inc.
P.O. Box 1431
Duncan, Oklahoma 73536-0431

Halliburton Energy Services
645 - 7th Ave SW Suite 1800
Calgary, AB
T2P 4G8
Canada

Prepared By
Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

1.4. Emergency telephone number
Emergency Telephone Number: 1-866-519-4752 or 1-760-476-3962
Global Incident Response Access Code: 334305
Contract Number: 14012

2. Hazards Identification

2.1 Classification in accordance with paragraph (d) of §1910.1200

Serious Eye Damage/Irritation: Category 2 - H319

2.2. Label Elements

Hazard Pictograms
Signal Word: Warning

Hazard Statements
H319 - Causes serious eye irritation

Precautionary Statements

Prevention
P264 - Wash face, hands and any exposed skin thoroughly after handling

Response
P280 - Wear eye protection/face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention

Storage
None

Disposal
None

2.3 Hazards not otherwise classified
None known

3. Composition/information on Ingredients

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>PERCENT (w/w)</th>
<th>GHS Classification - US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>60 - 100%</td>
<td>Eye Irrit. 2 (H319)</td>
</tr>
</tbody>
</table>

The exact percentage (concentration) of the composition has been withheld as proprietary.

4. First Aid Measures

4.1. Description of first aid measures

Inhalation  If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Eyes  In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.

Skin  Wash with soap and water. Get medical attention if irritation persists.

Ingestion  Do NOT induce vomiting. Give nothing by mouth. Obtain immediate medical attention.

4.2 Most important symptoms/effects, acute and delayed

Causes eye irritation

4.3. Indication of any immediate medical attention and special treatment needed

Notes to Physician  Treat symptomatically.

5. Fire-fighting measures

5.1. Extinguishing media

Suitable Extinguishing Media  Water fog, carbon dioxide, foam, dry chemical.

Extinguishing media which must not be used for safety reasons
None known.

5.2 Specific hazards arising from the substance or mixture
Special exposure hazards in a fire
Decomposition in fire may produce harmful gases.

5.3 Special protective equipment and precautions for fire-fighters
Special protective equipment for firefighters
Full protective clothing and approved self-contained breathing apparatus required for fire fighting personnel.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Use appropriate protective equipment. Avoid creating and breathing dust. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. See Section 8 for additional information

6.2. Environmental precautions
Prevent from entering sewers, waterways, or low areas.

6.3. Methods and material for containment and cleaning up
Scoop up and remove.

7. Handling and storage

7.1. Precautions for safe handling
Handling Precautions
Avoid contact with eyes, skin, or clothing. Avoid creating or inhaling dust. Ensure adequate ventilation. Wash hands after use. Launder contaminated clothing before reuse. Use appropriate protective equipment.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities
Storage Information
Store away from acids. Store in a cool, dry location. Product has a shelf life of 36 months.

8. Exposure Controls/Personal Protection

8.1 Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>OSHA PEL-TWA</th>
<th>ACGIH TLV-TWA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8.2 Appropriate engineering controls
Engineering Controls
Use in a well ventilated area. Localized ventilation should be used to control dust levels.

8.3 Individual protection measures, such as personal protective equipment
Personal Protective Equipment
If engineering controls and work practices cannot prevent excessive exposures, the selection and proper use of personal protective equipment should be determined by an industrial hygienist or other qualified professional based on the specific application of this product.

Respiratory Protection
If engineering controls and work practices cannot keep exposure below occupational exposure limits or if exposure is unknown, wear a NIOSH certified, European Standard EN 149, AS/NZS 1715:2009, or equivalent respirator when using this product. Selection of and instruction on using all personal protective...
equipment, including respirators, should be performed by an Industrial Hygienist or other qualified professional.

Hand Protection
- Normal work gloves.

Skin Protection
- Normal work coveralls.

Eye Protection
- Dust proof goggles.

Other Precautions
- None known.

### 9. Physical and Chemical Properties

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical State:</strong></td>
<td>Powder</td>
</tr>
<tr>
<td><strong>Odor:</strong></td>
<td>Odorless</td>
</tr>
<tr>
<td><strong>Color:</strong></td>
<td>White</td>
</tr>
<tr>
<td><strong>Odor Threshold:</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>pH:</strong></td>
<td>11.5</td>
</tr>
<tr>
<td><strong>Freezing Point / Range:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Melting Point / Range:</strong></td>
<td>851 °C</td>
</tr>
<tr>
<td><strong>Boiling Point / Range:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Flash Point:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas):</strong></td>
<td>No data available</td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Evaporation rate:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Vapor Pressure:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Vapor Density:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Specific Gravity:</strong></td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Water Solubility:</strong></td>
<td>Partly soluble</td>
</tr>
<tr>
<td><strong>Solubility in other solvents</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Autoignition Temperature:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Decomposition Temperature:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Viscosity:</strong></td>
<td>No data available</td>
</tr>
<tr>
<td><strong>Explosive Properties:</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Oxidizing Properties:</strong></td>
<td>No information available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Molecular Weight:</strong></td>
<td>105.99 g/mole</td>
</tr>
<tr>
<td><strong>VOC Content (%):</strong></td>
<td>No data available</td>
</tr>
</tbody>
</table>

### 10. Stability and Reactivity

#### 10.1. Reactivity

Not expected to be reactive.

#### 10.2. Chemical stability

Stable

#### 10.3. Possibility of hazardous reactions

Will Not Occur

#### 10.4. Conditions to avoid

None anticipated

#### 10.5. Incompatible materials

Strong acids.
10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide.

11. Toxicological Information

11.1 Information on likely routes of exposure
Principle Route of Exposure: Eye or skin contact, inhalation.

11.2 Symptoms related to the physical, chemical and toxicological characteristics

Acute Toxicity
- Inhalation: May cause mild respiratory irritation.
- Eye Contact: Causes eye irritation.
- Skin Contact: None known.
- Ingestion: Irritation of the mouth, throat, and stomach.

Chronic Effects/Carcinogenicity: No data available to indicate product or components present at greater than 0.1% are chronic health hazards.

11.3 Toxicity data

Toxicology data for the components

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>4090 mg/kg (Rat)</td>
<td>2210 mg/kg (Mouse)</td>
<td>2.3 mg/L (Rat) 2h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2800 mg/kg (Rat)</td>
<td>&gt; 2000 mg/kg (Rabbit)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin corrosion/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Non-irritating to the skin</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Serious eye damage/irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Irritating to eyes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Skin Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Respiratory Sensitization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mutagenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>In vivo tests did not show mutagenic effects.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Carcinogenic Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>No information available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Reproductive toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Did not show teratogenic effects in animal experiments.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - single exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>No significant toxicity observed in animal studies at concentration requiring classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>STOT - repeated exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>No significant toxicity observed in animal studies at concentration requiring classification.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Aspiration hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

12. Ecological Information
12.1. Toxicity

**Substance Ecotoxicity Data**

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to Invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>EC50 242 mg/L (Nitzschia)</td>
<td>TLM24 385 mg/L</td>
<td>No information available</td>
<td>EC50 265 mg/L (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LC50 310-1220 mg/L</td>
<td></td>
<td>EC50 (48h) 200 – 227 mg/L</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Pimephales promelas)</td>
<td></td>
<td>(Ceriodaphnia sp.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LC50 (96h) 300 mg/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(Lepomis macrochirus)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Persistence and Degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>The methods for determining biodegradability are not applicable to inorganic substances.</td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>No information available</td>
</tr>
</tbody>
</table>

12.5 Other adverse effects
No information available

13. Disposal Considerations

13.1. Waste treatment methods
Disposal methods: Bury in a licensed landfill according to federal, state, and local regulations.
Contaminated Packaging: Follow all applicable national or local regulations.

14. Transport Information

**US DOT**

<table>
<thead>
<tr>
<th>UN Number</th>
<th>Not restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name:</td>
<td>Not restricted</td>
</tr>
<tr>
<td>Transport Hazard Class(es):</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Environmental Hazards:</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**Canadian TDG**

<table>
<thead>
<tr>
<th>UN Number</th>
<th>Not restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name:</td>
<td>Not restricted</td>
</tr>
<tr>
<td>Transport Hazard Class(es):</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Environmental Hazards:</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**IMDG/IMO**

<table>
<thead>
<tr>
<th>UN Number</th>
<th>Not restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name:</td>
<td>Not restricted</td>
</tr>
<tr>
<td>Transport Hazard Class(es):</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Packing Group:</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Environmental Hazards: Not applicable

IATA/ICAO
UN Number Not restricted
UN proper shipping name: Not restricted
Transport Hazard Class(es): Not applicable
Packing Group: Not applicable
Environmental Hazards: Not applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable
Special Precautions for User None

15. Regulatory Information

US Regulations
US TSCA Inventory All components listed on inventory or are exempt.

TSCA Significant New Use Rules - S5A2

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>TSCA Significant New Use Rules - S5A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA Title III Extremely Hazardous Substances

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>EPA SARA Title III Extremely Hazardous Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA SARA (311,312) Hazard Class
Acute Health Hazard

EPA SARA (313) Chemicals

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>Toxic Release Inventory (TRI) - Group I</th>
<th>Toxic Release Inventory (TRI) - Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA CERCLA/Superfund Reportable Spill Quantity

<table>
<thead>
<tr>
<th>Substances</th>
<th>CAS Number</th>
<th>CERCLA RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

EPA RCRA Hazardous Waste Classification
If product becomes a waste, it does NOT meet the criteria of a hazardous waste as defined by the US EPA.

California Proposition 65 All components listed do not apply to the California Proposition 65 Regulation.
MA Right-to-Know Law Does not apply.
NJ Right-to-Know Law Does not apply.
PA Right-to-Know Law Does not apply.

NFPA Ratings: Health 1, Flammability 0, Reactivity 0
HMIS Ratings: Health 1, Flammability 0, Reactivity 0, PPE: B

Canadian Regulations

Canadian Domestic Substances All components listed on inventory or are exempt.
List (DSL)
16. Other information

Preparation Information
Prepared By: Chemical Stewardship
Telephone: 1-281-871-6107
e-mail: fdunexchem@halliburton.com

Revision Date: 23-Mar-2017

Reason for Revision: SDS sections updated: 1

Additional information
For additional information on the use of this product, contact your local Halliburton representative.

For questions about the Safety Data Sheet for this or other Halliburton products, contact Chemical Stewardship at 1-580-251-4335.

Key or legend to abbreviations and acronyms used in the safety data sheet
bw – body weight
CAS – Chemical Abstracts Service
d - day
EC50 – Effective Concentration 50%
ErC50 – Effective Concentration growth rate 50%
h - hour
LC50 – Lethal Concentration 50%
LD50 – Lethal Dose 50%
LL50 – Lethal Loading 50%
mg/kg – milligram/kilogram
mg/L – milligram/liter
mg/m³ – milligram/cubic meter
mm – millimeter
mmHg – millimeter mercury
NIOSH – National Institute for Occupational Safety and Health
NTP – National Toxicology Program
OEL – Occupational Exposure Limit
PEL – Permissible Exposure Limit
ppm – parts per million
STEL – Short Term Exposure Limit
TWA – Time-Weighted Average
UN – United Nations
w/w – weight/weight

Key literature references and sources for data
www.ChemADVISOR.com/

Disclaimer Statement
This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

End of Safety Data Sheet
1. Identification

1.1 Product identifier

Product name: DRILPLEX† HDD
Product code: 12013

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use: Rheology modifier.
Uses advised against: Consumer use

1.3 Details of the supplier of the safety data sheet

Supplier:
M-I PRODUCTION TECHNOLOGIES
A Business Unit of M-I L.L.C.
P.O. Box 42842
Houston, TX 77242
www.miswaco.slb.com

Prepared by:
Global Chemical Regulatory Compliance (GCRC) , Mike McDowell

1.4 Emergency Telephone Number

Emergency telephone: (24 Hour) Australia +61 2801 44558, Asia Pacific +65 3158 1074, China +86 10 5100 3039, Europe +44 (0) 1235 239 670, Middle East and Africa +44 (0) 1235 239 671, New Zealand +64 9929 1483, USA 001 281 561 1600
Telephone Number: 281-561-1511

2. Hazards identification

2.1 Classification of the substance or mixture

GHS - Classification

Health hazards:
- Serious eye damage/eye irritation: Category 2

Environmental hazards: Not classified

Physical Hazards: Not classified

2.2 Label elements
Hazard statements
H319 - Causes serious eye irritation

Precautionary statements
P264 - Wash face, hands and any exposed skin thoroughly after handling
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337 + P313 - If eye irritation persists: Get medical advice/attention

Unknown acute toxicity
45.05% of the mixture consists of ingredient(s) of unknown toxicity.

3. Composition/information on Ingredients

3.1 Substances
Not Applicable

3.2 Mixtures

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight % - range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>497-19-8</td>
<td>30 - 60</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>1305-62-0</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

4. First aid measures

4.1 First-Aid Measures

Inhalation
If inhaled, remove from area to fresh air. Get medical attention if respiratory irritation develops or if breathing becomes difficult.

Ingestion
Rinse mouth. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Seek medical attention if irritation occurs.

Skin contact
Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention immediately if symptoms occur.

Eye contact
Remove contact lenses. Promptly wash eyes with lots of water while lifting eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.
4.2 Most important symptoms and effects, both acute and delayed

General advice
The severity of the symptoms described will vary dependant of the concentration and the length of exposure. If adverse symptoms develop, the casualty should be transferred to hospital as soon as possible.

Main symptoms

Inhalation
Please see Section 11. Toxicological Information for further information.

Ingestion
Please see Section 11. Toxicological Information for further information.

Skin contact
Please see Section 11. Toxicological Information for further information.

Eye contact
Please see Section 11. Toxicological Information for further information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
Treat symptomatically

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Fog, Alcohol Foam, CO₂, Dry Chemical.

Extinguishing media which shall not be used for safety reasons
None known.

5.2 Special hazards arising from the substance or mixture

Unusual fire and explosion hazards
None known.

Hazardous combustion products
Fire or high temperatures create; Carbon dioxide (CO₂).

5.3 Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

Special Fire-Fighting Procedures
Containers close to fire should be removed immediately or cooled with water.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. See also section 8.

6.2 Environmental precautions

The product should not be allowed to enter drains, water courses or the soil.

Environmental exposure controls
Avoid release to the environment. Local authorities should be advised if significant spillages cannot be contained.
6.3 Methods and materials for containment and cleaning up

**Methods for containment**
Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up**
Sweep up and shovel into suitable containers for disposal. After cleaning, flush away traces with water.

6.4 Reference to other sections
See section 13 for more information.

7. Handling and storage

7.1 Precautions for safe handling

**Handling**
Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin and eyes. Avoid dust formation.

7.2 Conditions for safe storage, including any incompatibilities

**Technical measures/precautions**
Ensure adequate ventilation. Keep airborne concentrations below exposure limits.

**Storage precautions**
Keep containers tightly closed in a dry, cool and well-ventilated place. Avoid contact with: Acids

8. Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>Not Determined</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>5 mg/m³ (resp); 15 mg/m³ (total)</td>
<td>5 mg/m³ (resp); 15 mg/m³ (total)</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

All chemical Personal Protective Equipment (PPE) should be selected based on an assessment of both the chemical hazard present and the risk of exposure to those hazards. The PPE recommendations below are based on an assessment of the chemical hazards associated with this product. Where this product is used in a mixture with other products or fluids, additional hazards may be created and as such further assessment of risk may be required. The risk of exposure and need of respiratory protection will vary from workplace to workplace and should be assessed by the user in each situation.

**Engineering measures to reduce exposure**
Ensure adequate ventilation.

**Personal protective equipment**

**Eye protection**
It is good practice to wear goggles when handling any chemical. Tightly fitting safety goggles.

**Hand protection**
Repeated or prolonged contact.; Use protective gloves made of: Nitrile, Neoprene.

**Respiratory protection**
No personal respiratory protective equipment normally required, In case of insufficient ventilation wear suitable respiratory equipment, Half mask with a particle filter P2 (European Norm EN 143 = former DIN 3181).

**Skin and body protection**
Wear suitable protective clothing, Eye wash and emergency shower must be available at the work place.
| Hygiene measures | Wash hands before eating, drinking or smoking, Remove and wash contaminated clothing before re-use. |

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state</strong></td>
<td>Solid</td>
<td></td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>Powder Dust</td>
<td></td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Odorless</td>
<td></td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>Off-white</td>
<td></td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>Not applicable</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH</strong></td>
<td>pH @ dilution</td>
<td>10 - 10.8 @1%</td>
</tr>
<tr>
<td><strong>Melting/freezing point</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Boiling point/range</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Evaporation rate (BuAc =1)</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td><strong>Flammability Limits in Air</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Upper flammability limit</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Lower flammability limit</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Vapor pressure</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Specific gravity</strong></td>
<td>2.0 - 2.5</td>
<td>@ 20 °C</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Water solubility</strong></td>
<td>Miscible with water.</td>
<td></td>
</tr>
<tr>
<td><strong>Solubility in other solvents</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Kinematic viscosity</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Dynamic viscosity</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Log Pow</strong></td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td><strong>Explosive properties</strong></td>
<td>Not Applicable</td>
<td></td>
</tr>
<tr>
<td><strong>Oxidizing properties</strong></td>
<td>None known.</td>
<td></td>
</tr>
</tbody>
</table>

9.2 Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pour point</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Molecular weight</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>VOC content(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Stability and reactivity

10.1 Reactivity

No specific reactivity hazards associated with this product.

10.2 Chemical stability

Stable under normal temperature conditions and recommended use.

10.3 Possibility of Hazardous Reactions
Hazardous polymerization
Hazardous polymerization does not occur.

10.4 Conditions to avoid
Protect from moisture.

10.5 Incompatible materials
Acids. Oxidizing agents. Reacts with active metals such as sodium and potassium, amines, liquid fluorine, and liquid chlorine trifluoride. Maleic anhydride. Nitroparaffins.

10.6 Hazardous decomposition products
Carbon oxides (COx). Sodium oxides. Metal fumes.

11. Toxicological information

11.1 Information on toxicological effects

Unknown acute toxicity

Inhalation
Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough.

Eye contact
Causes serious eye irritation.

Skin contact
Causes skin irritation.

Ingestion
Irritant; may cause pain or discomfort to mouth, throat and stomach.

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>= 4090 mg/kg ( Rat )</td>
<td>No data available</td>
<td>No data available</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>= 7340 mg/kg ( Rat )</td>
<td>No data available</td>
<td>No data available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>IARC Group 1 or 2</th>
<th>ACGIH - Carcinogens</th>
<th>OSHA listed carcinogens</th>
<th>NTP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Sensitization
This product does not contain any components suspected to be sensitizing.

Mutagenic effects
This product does not contain any known or suspected mutagens.

Carcinogenicity
This product does not contain any known or suspected carcinogens.

Reproductive toxicity
No evidence of toxicity to reproduction.

Developmental toxicity
Not known to cause birth defects or have a deleterious effect on a developing fetus.

Routes of exposure
Eye contact. Skin contact.

Routes of entry
No route of entry noted.

Specific target organ toxicity
Not classified
Specific target organ toxicity (repeated exposure) Not classified.

Neurological effects None known.

Target organ effects None known.

Aspiration hazard No hazard from product as supplied.

### 12. Ecological information

#### 12.1 Toxicity

**Toxicity to algae**
This product is not considered toxic to algae. See component information below.

**Toxicity to fish**
This product is not considered toxic to fish. See component information below.

**Toxicity to daphnia and other aquatic invertebrates**
This product is not considered toxic to invertebrates. See component information below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Toxicity to fish</th>
<th>Toxicity to algae</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>300 mg/L LC50</td>
<td>242 mg/L EC50</td>
<td>265 mg/L EC50</td>
</tr>
<tr>
<td></td>
<td>(Lepomis macrochirus) = 96 h</td>
<td>(Nitzschia) = 120 h</td>
<td>(Daphnia magna) = 48 h</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>160 mg/L LC50</td>
<td>No information available</td>
<td>No information available</td>
</tr>
<tr>
<td></td>
<td>(Gambusia affinis) = 96 h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 12.2 Persistence and degradability

Not Applicable - Inorganic chemical.

#### 12.3 Bioaccumulative potential

Not Applicable - Inorganic chemical.

#### 12.4 Mobility in soil

The product is miscible with water. May spread in water systems.

#### 12.5 Results of PBT and vPvB assessment

This preparation contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)
This preparation contains no substance considered to be very persistent nor very bioaccumulating (vPvB)

#### 12.6 Other adverse effects

None known.

### 13. Disposal considerations
13.1 Waste treatment methods

Disposal Method  
Disposal should be made in accordance with federal, state and local regulations.

Contaminated packaging  
Empty containers should be taken for local recycling, recovery or waste disposal.

14. Transport information

14.1 UN Number

Not regulated

UN/ID No. (ADR/RID/ADN/ADG)  
Not regulated

UN No. (IMDG)  
Not regulated

UN No. (ICAO)  
Not regulated

UN No. (DOT)  
Not regulated

14.2 Proper shipping name

Not regulated for transportation by DOT, TDG, IMDG and ICAO/IATA.

14.3 Hazard class(es)

ADR/RID/ADN Hazard class  
Not regulated

IMDG Hazard class  
Not regulated

ICAO Hazard class/division  
Not regulated

DOT Hazard class  
Not regulated

14.4 Packing group

ADR/RID/ADN Packing Group  
Not regulated

IMDG Packing group  
Not regulated

ICAO Packing group  
Not regulated

DOT Packing group  
Not regulated

Marine pollutant

No

14.6 Special precautions

Not Applicable

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

International inventories

USA (TSCA)  
Complies

European Union (EINECS and ELINCS)  
Complies

Canada (DSL)  
Complies

Philippines (PICCS)  
Does not Comply

Japan (ENCS)  
Does not Comply

China (IECSC)  
Complies

Australia (AICS)  
Does not Comply

Korean (KECL)  
Complies
New Zealand (NZIoC)  Does not Comply

IMPORTS, Canada
No import volume restrictions.

U.S. Federal and State Regulations

<table>
<thead>
<tr>
<th>Component</th>
<th>SARA 302 / TPQs</th>
<th>SARA 313</th>
<th>CERCLA RQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium carbonate</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Calcium hydroxide</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

State Comments
Proposition 65: This product is not known to contain chemicals considered by the State of California's Safe Drinking Water and Toxic Enforcement Act of 1986 as causing cancer and/or reproductive toxicity at levels that are expected to pose a significant risk under anticipated use conditions.

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

WHMIS Hazard Class  D2B

16. Other information

Supersedes date  20/Dec/2013
Revision date    23/Dec/2014
Version          9

Health  2
Flammability    1
Physical hazard 0
PPE           E

†A mark of M-I L.L.C.

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
August 23, 2019

Mr. Shaun Kavajecz

Dear Sir,

Per your request

All vendors/manufacturers were questioned regarding sulphate content in their products.

These are the results.

<table>
<thead>
<tr>
<th>Product name</th>
<th>Contains sulphates?</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>CETCO SuperGel X</td>
<td>X</td>
<td>3-36 meg/100 grams</td>
</tr>
<tr>
<td>Soda Ash</td>
<td>X</td>
<td>&lt;200mg/KG</td>
</tr>
<tr>
<td>AMC Gel</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>ClayBreaker/ ClayCutter</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>TorqBreaker</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>FlowPac</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SandMaster</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SealPac</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HDD Lube</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Magma Fiber</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>PolyMud</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Advise any questions you may have.

Best Regards

Don White
DCS Fluid Solutions
Dear Sir,

Per your request. All vendors/manufacturers were questioned regarding sulphate content in their products.

The results are as follows:

<table>
<thead>
<tr>
<th>DMD Product Name</th>
<th>Product Purpose</th>
<th>Product Dosage Recommendation</th>
<th>Sulfate Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Soda Ash/Soda Ash</td>
<td>Condition Water/Control pH</td>
<td>Add 1lb Soda Ash/250 gallons to raise pH by 1</td>
<td>none*</td>
</tr>
<tr>
<td>Barakade Bentonite</td>
<td>Bentonite base for fluid viscosity</td>
<td>Add 15-20lbs per 100 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Star Flex</td>
<td>Rheology Enhancer/Suspension Boost</td>
<td>Add 3lbs per 250 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Power PAC L</td>
<td>Wall Cake Enhancer/Bore Stabilizer</td>
<td>Add 1lb per 100 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Power XAN/No Sag</td>
<td>Hole Cleaning Enhancer/Suspension Boost</td>
<td>Add 1lb per 100 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Lubra Star</td>
<td>Lubricity Enhancer/Torque &amp; Friction Reducer</td>
<td>Add 1gal per 100 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Power Thin</td>
<td>Clay Cutter/Mud Thinner</td>
<td>Add 1gal per 250 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Magma Fiber LCM</td>
<td>Formation Sealing/Hole Plugging Aid</td>
<td>Add 5-15lbs per 100 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>Power Swell/Diamond Seal</td>
<td>Formation Sealing/Hole Plugging Aid</td>
<td>Add 5-15lbs per 100 gallons</td>
<td>none*</td>
</tr>
<tr>
<td>EZ Mud Gold</td>
<td>Clay/Shale Stabilizer, Clay Swell Inhibitor</td>
<td>Add 1-2lbs per 100 gallons</td>
<td>none*</td>
</tr>
</tbody>
</table>

*product contains no sulfates as part of manufacturing/blending/packaging process

**to be determined, awaiting final determination from blending facility

Please advise if you have any questions.

Regards,

[Signature]

Paul Bonato
Operations Manager

T 720.489.0300
M 720.934.1614
pbonato@muddirect.net
Jared: Please find attached the sulfate addition rates for the M I Swaco products.

Thank you,

Rick Zavitz
Project Manager / Drilling Fluid Specialist
Directional Crossings Operations,
Michels Corporation
817 Main St
Brownsville, Wi
53006

Begin forwarded message:

From: Sherry Adams <shadams@miswaco.slb.com>
Date: March 27, 2019 at 10:36:33 AM EDT
To: Rick Zavitz <rzavitz@michels.us>
Subject: RE: [Ext] Drilling Products

Here you go, let me know if you need anything else
Thanks Rick

Max Gel = 0-1%
Drilplex = 0%
RingFree = 0%

From: Sherry Adams
Sent: Wednesday, March 27, 2019 9:07 AM
To: 'Rick Zavitz' <rzavitz@michels.us>
Subject: RE: [Ext] Drilling Products

Checking for you now.

From: Rick Zavitz <rzavitz@michels.us>
Sent: Wednesday, March 27, 2019 7:31 AM
To: Sherry Adams <shadams@miswaco.slb.com>
Subject: [Ext] Drilling Products

Sherry: I am doing some submittals for an upcoming project. I have been asked specifically for sulfate content (as a percentage) of the following products;
Max Gel
Drilplex
RingFree.
Bill Colson  
Pretec Directional Drilling  
General Manager  
C: (715) 579-0619  
E: bcolson@pretecdd.com

Dear Mr. Colson,

Per your request DCS Fluid Solutions has conducted a search of our Safety Data Sheets for the chemical compounds that are banned for use in drilling fluid additives on the Enbridge Line 3 Replacement project. The MPCA banned chemicals searched for are below.

Table 1. Banned additives
Nonylphenol ethoxylates:
CAS no. 9016-45-9 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy-
CAS no. 26027-38-3 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy-
CAS no 37205-87-1 Poly (oxy-1,2-ethanediyl, alpha-(isononylphenyl)-omega-hydroxy-
CAS no. 68412-54-4 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy-, branched
CAS no. 127087-87-0 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy-, branched
Nonylphenol:
CAS no. 25154-52-3 Phenol, nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP) CAS no. 104-40-5 Phenol, 4-nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP) CAS no. 84852-15-3 Phenol, 4-nonyl-, branched.

None of our proposed additives listed below contained MPCA banned chemicals.

AMC Gel  
ClayBreaker  
PolyMud  
Sandmaster  
TorqBreaker  
SealPac  
Soda Ash  
Super GelX

Best Regards

Don White  
General Manager  
DCS Fluid Solutions  
dcsfluids@sbcglobal.net
Mr. Shaun Kavajecz  
Director, Environment  
Precision Pipeline, LLC  

October 18, 2019  

Shaun:

Per your request we have audited our drilling fluid products to check for banned additives/additive components. Specifically, the list of products below were reviewed:

1. Barakade Bentonite  
2. EZ mud Gold  
3. Power PAC L  
4. Power Swel!  
5. Power Thin  
6. Power XAN  
7. Star Plex  
8. Lubra Star Plus  
9. Magma Fiber LCM  
10. Power Soda Ash/Soda Ash

Statement 1 — Drilling Mud Direct, LLC has verified that Products 1 – 10 listed above, do not include any of the additives listed below:

Nonylphenol ethoxylates:

CAS no. 9016-45-9 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy-)  
CAS no. 26027-38-3 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy-)  
CAS no. 37205-87-1 Poly (oxy-1,2-ethanediyl, alpha-(isononylphenyl)-omega-hydroxy-)  
CAS no. 68412-54-4 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy-, branched)  
CAS no. 127087-87-0 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy-, branched)

Nonylphenol:

CAS no. 25154-52-3 Phenol, nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP)  
CAS no. 104-40-5 Phenol, 4-nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP)  
CAS no. 84852-15-3 Phenol, 4-nonyl-, branched.

Should you require any additional information, please do not hesitate to contact us. We are standing by to jump into action if needed.

Kind Regards,

Clint Pitman, General Manager  
Drilling Mud Direct, LLC
Max Gel

This letter is to confirm that the product supplied by M-I SWACO, MAX GEL®, does not contain any of the additives listed in the table below:

Table 1. Banned additives
Nonylphenol ethoxylates:
CAS no. 9016-45-9 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy
CAS no. 26027-38-3 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy
CAS no. 37205-87-1 Poly (oxy-1,2-ethanediyl, alpha-(isononylphenyl)-omega-hydroxy
CAS no. 68412-54-4 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy-, branched
CAS no. 127087-87-0 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy-, branched

Nonylphenol:
CAS no. 25154-52-3 Phenol, nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP)
CAS no. 104-40-5 Phenol, 4-nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP)
CAS no. 84852-15-3 Phenol, 4-nonyl-, branched.

David Horton
Manager – M-I SWACO, HDD, Mining, & Waterwells

Date: Oct. 16, 2019
DrilPlex HDD

This letter is to confirm that the product supplied by M-I SWACO, DRILPLEX HDD, does not contain any of the additives listed in the table below:

Table 1. Banned additives
Nonylphenol ethoxylates:
CAS no. 9016-45-9 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy
CAS no. 26027-38-3 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy
CAS no. 37205-87-1 Poly (oxy-1,2-ethanediyl, alpha-(isononylphenyl)-omega-hydroxy
CAS no. 68412-54-4 Poly (oxy-1,2-ethanediyl, alpha-(nonylphenyl)-omega-hydroxy-, branched
CAS no. 127087-87-0 Poly (oxy-1,2-ethanediyl, alpha-(4-nonylphenyl)-omega-hydroxy-, branched

Nonylphenol:
CAS no. 25154-52-3 Phenol, nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP)
CAS no. 104-40-5 Phenol, 4-nonyl- (assumes linear alkyl, not viewed as descriptive of commercial NP)
CAS no. 84852-15-3 Phenol, 4-nonyl-, branched.

Date: Oct. 16, 2019

David Horton
Manager – M-I SWACO, HDD, Mining, & Waterwells